



**ESCRS**

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**CLINICAL  
TRENDS  
SURVEY**

**2019  
Results**

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# Survey Background & Data Overview

This report contains the results of the 2019 ESCRS Clinical Trends Survey, conducted at the 37th ESCRS Congress in Paris, France. 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 ocular surface disease.

More than 2,100 doctors responded to 156 questions, which were developed and reviewed with the ESCRS leadership and substantiated by a data scientist. The survey results help ESCRS to better identify the educational needs of its members and the ESCRS leadership continually refers to the results of the annual surveys and the feedback they elicit. The collected data also enhances the education featured at the ESCRS Annual Congress, the ESCRS Winter Meeting and other educational channels, such as EuroTimes articles and online forums.

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 upcoming 2020 ESCRS Clinical Trends Survey, taking place online during 38th ESCRS Virtual Congress, October 2-4, 2020 at <https://escrs2020.questionpro.com>

156

Questions on key clinical opinions and practice patterns

2,149

ESCRS Delegates responded to the clinical survey

## Years in Practice

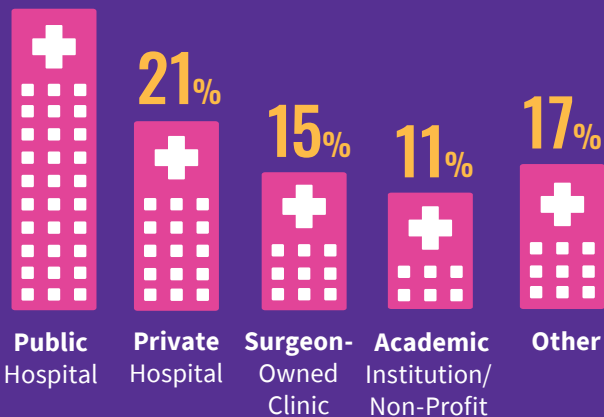


> 10 years

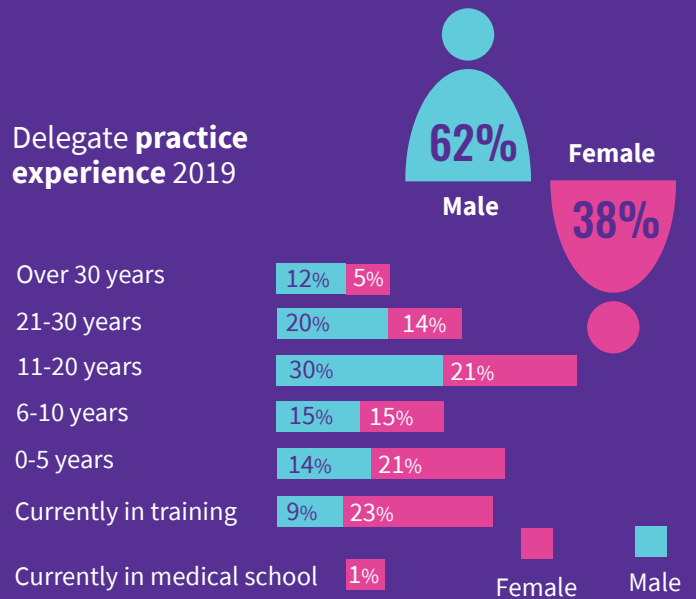
Currently in medical school or in training



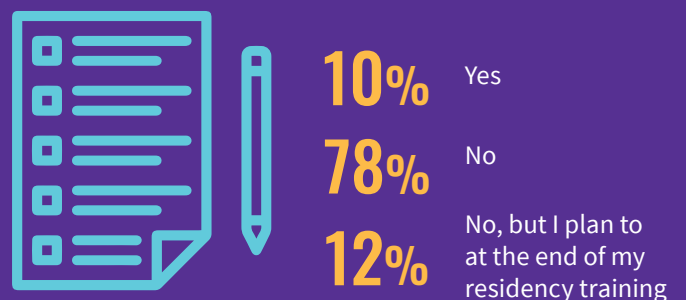
## Primary surgery location



## Delegate practice experience 2019



## Have you completed the Fellow of the European Board of Ophthalmology (FEBO) exam?



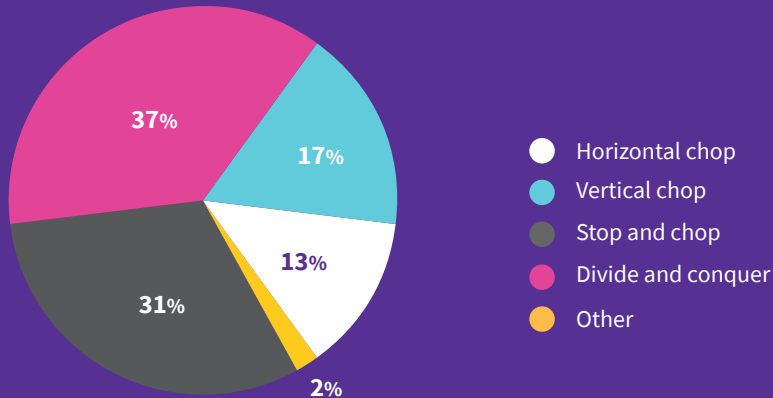
# General Cataract Surgery

Average annual volume of cataract surgery

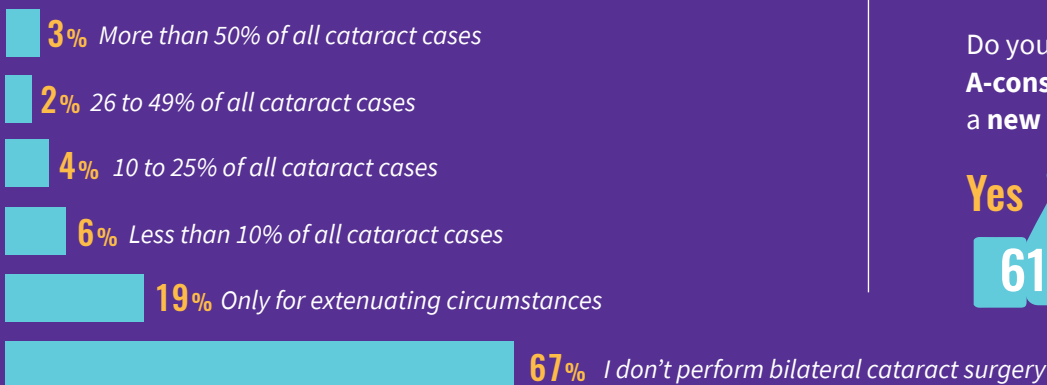
**368**



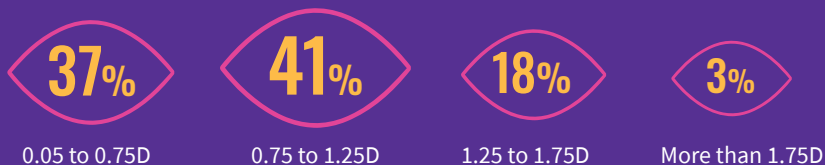
What is your preferred method of breaking the nucleus during phacoemulsification?



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



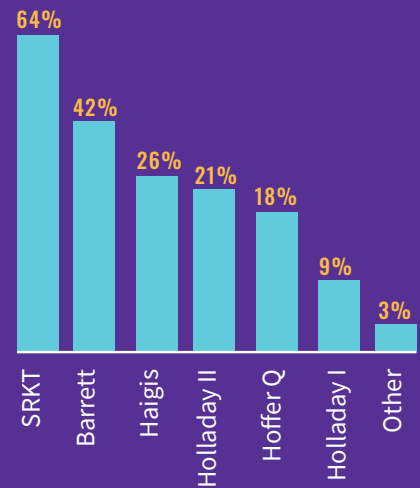
What is your most common level of diopter correction you target for monovision?



**20%**

of ophthalmologists perform **> 600** cataract surgeries per year

What is your preferred lens formula for the majority of your cataract surgeries?



Do you routinely optimize your A-constants every time you use a new lens?

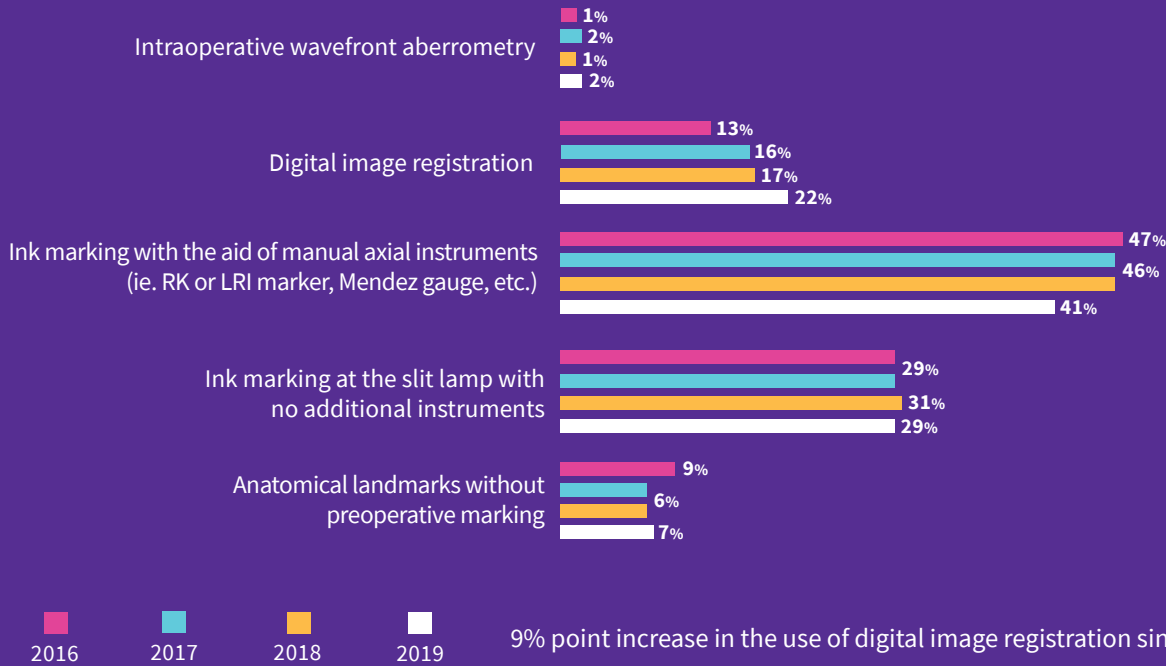


# Toric IOLs & Astigmatism Management

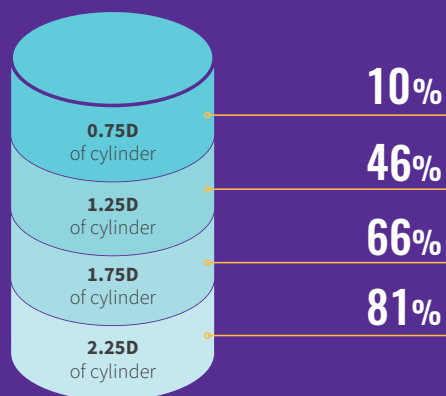
For patients with **clinically significant astigmatism**, 13% of current cataract procedures involve a **toric IOL** (6% point increase since 2016 survey)



## Preferred options for alignment of the intended axis of placement for a toric IOL



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



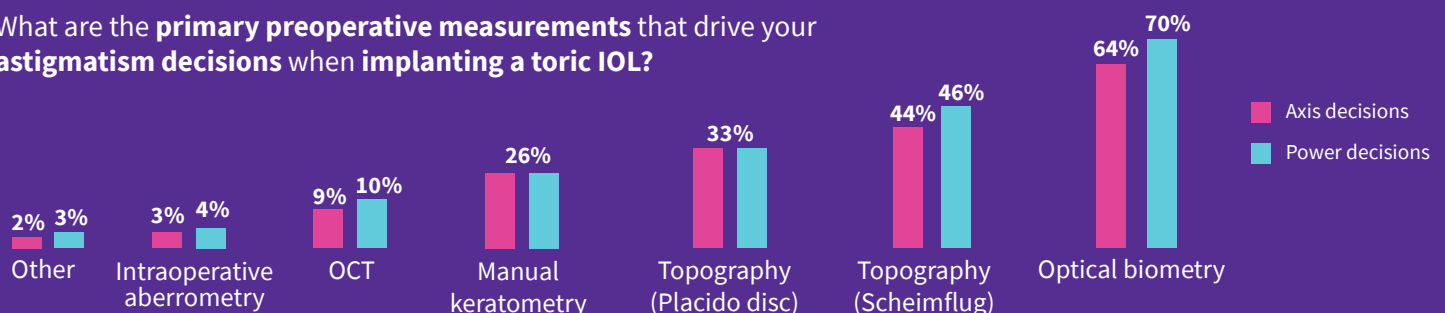
52%

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

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



## What are the primary preoperative measurements that drive your astigmatism decisions when implanting a toric IOL?



# Toric IOLs & Astigmatism Management



By Arthur B. Cummings, MB ChB, FCS(SA), MMed(Ophth), FRCS(Edin)

The astigmatism management portion of the ESCRS Clinical Trends Survey for 2019 found that 13% of cataract procedures involve a toric IOL in patients with clinically significant astigmatism. This represents a 6%-point increase since the 2016 survey. However, survey respondents noted that if cost were not an issue, they would implant a toric IOL in more than half—52%—of cataract patients with clinically significant astigmatism.

In terms of the amount of cylinder, survey respondents correct with a toric IOL in monofocal cataract patients, 10% use the technology for as little as 0.75 D of cylinder, 46% for 1.25 D, 66% for 1.75 D and 81% for 2.25 D.

## TOOLS USED FOR ACCURATE PLACEMENT

When it comes to tools for aligning the intended axis of placement for a toric IOL, the survey revealed that 40% of respondents rely on ink marking with the aid of manual axial instruments. Ink marking at the slit lamp using no additional instruments is the standard approach for 29% of respondents, and 22% use digital image registration—interestingly, this method increased by 9%-points since the 2016 survey. Only 7% of survey respondents rely on anatomical landmarks without preoperative marking and a small fraction, just 2%, utilize intraoperative wavefront aberrometry.

For accurate toric IOL alignment, I use a downloadable smartphone app. The app acts as a see-through camera overlay on the eye. This allows me to measure the original marks and determine where they truly are. An ink mark can change or disappear. With my current method, I can see exactly the epicenter of the mark, the marks are clearly there prior to surgery, and I know exactly where the reference is. This has worked so well in my hands that I have only rotated two IOLs in the past 6 years. This also indicates the excellent stability of toric technology.

## WHEN TO REPOSITION

The survey asked delegates how many degrees of postoperative rotational error is acceptable before visual quality and degradation of visual acuity are significantly affected following toric IOL implantation. More than half of respondents (52%) said <5 degrees, 41% believe 6-10 degrees is the cut-off, and 7% responded >11 degrees.

When it comes to deciding whether it is necessary to re-align a toric implant, the consideration has more to do with the refractive outcome than a set number of degrees. If the placement is off by 3 to 5 degrees, the result may still be acceptable. If the patient is not happy with the visual acuity outcome, however, that is a different matter. In that case, the surgeon can use ocular wavefront technology with simultaneous topography, to determine corneal toricity and the amount of rotation needed.

For every 1 degree a toric IOL is off target, 3% of the effect is lost, but low diopter toric implants are quite forgiving. If the implant is 1.50 D, for example, the result can be off by 20% but patients will not notice the small amount of residual astigmatism. With a higher amount of astigmatism, however, accuracy is increasingly important.

Just under 70% of ESCRS delegates who responded to the survey consider posterior corneal astigmatism in their toric power calculations, leaving 31% who do not. Calculating posterior corneal astigmatism is crucial for accuracy. Recent IOL formulas such as Barrett take this into account for enhanced accuracy. In the absence of an accurate measure of the posterior surface of the cornea it is safer to use the expected toricity for against-the-rule versus with-the-rule astigmatism as well as taking into account the patient's age.

## MEASUREMENTS THAT DRIVE POWER AND AXIS DECISIONS

When surveyed about the primary preoperative measurements that drive their astigmatism decisions for implanting a toric IOL, most respondents to the 2019 ESCRS Clinical Trends Survey consider optimal biometry. Seventy percent noted its importance in power decisions and 64% use it for axis decisions. Tomography (Scheimpflug) plays a role for 46% of respondents in terms of power decisions and 44% for axis selection. Next most common consideration is topography, used by 33% for both power and axis decisions; manual keratometry is used by 26% for both power and axis, OCT used by 9% and 10%, intraoperative aberrometry by 4% and 3%, and other was noted by 3% and 2% respectively for power and axis decisions.

We are very serious about refractive outcomes for every cataract patient in our practice. To obtain the best results, I believe it is important to get readings from separate devices. My routine workup consists of two optical biometry readings, one tomography measurement—Scheimpflug — and Placido disk-based topography. Typically, these astigmatism measurements will be similar; however, variations do occur. A large discrepancy likely indicates dry eye disease. A significant variation in axis and magnitude of corneal astigmatism calls for further dry eye investigation and if needed, subsequent treatment to improve the tear film. I then repeat the tests.

Selecting the proper lens technology for individual patients is of course key to success. For example, with a toric multifocal IOL, surgeons must make sure the patient has regular corneal astigmatism without significant higher-order aberrations. Otherwise, I consider a topography-guided corneal procedure first to regularize the cornea before implanting an IOL. If the patient is not keen on having two procedures but is still seeking a superior refractive outcome, I may consider a pinhole IOL technology.

## CONCLUSION

Correcting patients' astigmatism has implications not only for satisfaction but also in terms of safety and quality of life. Patients with uncorrected astigmatism are at a greater risk of falls, for example, with the associated hospitalization, comorbidities, and cost to the overall health care system.

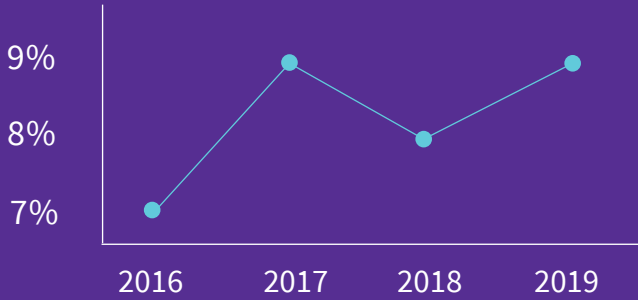
If we can make patients' vision better with a toric IOL, then we should provide them with the appropriate education regarding the technology's benefits so they can make an informed decision. Studies consistently reveal that well-informed patients are willing to pay for improvements in technology. There is no other procedure that offers more value for its cost than cataract surgery, and it is only done once. Therefore, it makes sense to implant the best possible lens option for each patient.

“

Correcting patients' astigmatism has implications not only for satisfaction but also in terms of safety and quality of life

# Presbyopia-Correcting IOLs

9% of current **cataract procedures** involve **presbyopia-correcting IOLs** (2% point increase since 2016 survey)



**≥0 TO ≤1.0D**  
postoperative residual **CYLINDER**

**93%** believe this is likely to have an impact on visual quality and patient satisfaction in patients implanted with a **bifocal/trifocal IOL**

**92%** believe this is likely to have an impact on visual quality and patient satisfaction in patients implanted with an **EDOF IOL**

**Biggest concerns** against performing more **presbyopia-correcting IOL** procedures

**61%** **Cost to patient**

**44%** Concern over **night time quality**

**36%** Concern over loss of **cataract visual acuity**

**13%**

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

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

**63%**

Trifocal IOLs

**20%**

Extended depth of focus IOLs

**15%**

Bifocal IOLs

**2%**

Other

**1%**

Accommodating IOLs

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...**



**5%** In a **trifocal presbyopia-correcting IOL** patient

**5%** In a **bifocal presbyopia-correcting IOL** patient

**4%** In an **EDOF presbyopia-correcting IOL** patient

**2%** In a **monovision patient with two monofocal IOLs**

# Presbyopia-Correcting IOLs



By Sathish Srinivasan, FRCSEd, FRCOphth, FACS

**A**ccording to the results of the 2019 ESCRS Clinical Trends Survey, 9% of current cataract procedures involve presbyopia-correcting IOLs. This is a 2%-point increase since the 2016 survey. Among the presbyopia-correcting lens types used by the survey takers, 13% of current presbyopia-correcting IOL procedures are with toric versus spherical technology.

## LENS TECHNOLOGY

The largest percentage of survey respondents—63%— said that they use trifocal implants for the majority of their patients, 20% use extended-depth-of focus IOLs for most patients, 14% implant bifocal lenses with the highest frequency, and 1% responded that they use accommodating technology in the majority of their patients. Other technology accounts for the majority of lenses implanted for 2% of respondents.

For presbyopia correction, trifocal IOLs comprise the majority of my cataract procedures—close to 75%. I currently use the small-aperture lens for approximately 15% of patients, and 5% of my implantations are using a light adjustable lens. I am the only surgeon in the United Kingdom using this new, disruptive technology. The small-aperture lens is an excellent IOL choice for abnormal corneas, such as in patients who are post-refractive surgery, have keratoconus, or corneal scars from injury. Although implantation of the light adjustable lens is quite labor and time intensive for both the surgeon and the patient, the IOL has a niche role to play for some of my post-refractive patients.

## KEY OBSTACLES

When it comes to surgeons' objections around performing more presbyopia-correcting IOL procedures, the biggest concern by far is cost to the patient at 61%. The second most common obstacle is worries over night-time quality of vision, noted by 44% of surgeons, followed by the issue of a loss of contrast visual acuity, selected by 36%.

Once I have determined that a patient is a good candidate for presbyopia-correcting technology based on the measurements obtained from the cataract workup and visual needs based on a questionnaire, I have a detailed benefit and risk discussion. In particular, we talk about the possibility of slightly decreased contrast, glare and halo issues—particularly with nighttime driving. I show them a computer-generated simulation of visual aberrations and ensure they are fully informed. Patients receive detailed information about their options, so they have a complete understanding of the presbyopia-correcting technology available to them when they come back for a consultation. I find that when patients know the benefits associated with presbyopia-correcting lenses, they are not discouraged by cost.

## RESIDUAL ERROR

The survey asked ESCRS delegates about what they believe the chances are of a patient, who has no residual refractive error and a healthy ocular surface, having functionally significant visual aberrations at night with a variety of technology. Respondents believe the chance is 5% in patients implanted with a bifocal or a trifocal presbyopia-correcting IOL. Patients receiving EDOF presbyopia-correcting technology have a 4% chance of visual aberrations at night, according to the survey, and the lowest chance, 2%, is for a monovision patient receiving two monofocal implants.

Almost all respondents believe even a small amount of postoperative residual cylinder (i.e. less than or equal to 1.00 D) is likely to have an impact on visual quality and patient satisfaction in patients implanted with a bifocal and/or a trifocal IOL, 93%, and an EDOF IOL, 92%.

I do not believe in chasing numbers when it comes to residual cylinder or spherical error. Rather I go by patients' satisfaction with their visual outcomes. The most important factor is if they are happy with their postoperative result. If they feel as if their quality of vision is not as good as they would like, only then do I address their concerns with an additional procedure.

Accurate biometry and other preoperative measurements as well as addressing astigmatism ensures high-quality outcomes and happy patients following presbyopia-correcting procedures. By avoiding implanting the technology in cataract patients who are not ideally suited and only selecting the proper candidates based on their visual needs and testing, surgeons can have success with presbyopia-correcting IOLs.

## ON THE HORIZON

Thinking about the future, technology that the largest number of surgeons are looking forward to using in the next 5 years are trifocal and/or quadrifocal IOLs—60%. Slightly more than half, 51%, have interest in extended range of vision multifocal IOLs, 22% are excited about shape changing IOLs, 20% chose light adjustable IOLs, and 19% responded that they are looking forward to incorporating presbyopia femtosecond ablations in the next 5 years.

“ Accurate biometry and other preoperative measurements as well as addressing astigmatism ensures high-quality outcomes and happy patients following presbyopia-correcting procedures

# Glaucoma Management & MIGS

**27** average number of patients seen each month that are considered to have glaucoma

**12%** average percentage of cataract patients estimated to have glaucoma

**26%** of patients are **NOT compliant** who are prescribed **ONE or TWO medications** to control their glaucoma



**13%** of cataract surgery patients, currently on **topical therapy** for glaucoma are candidates for a **minimally invasive glaucoma surgery (MIGS) device**

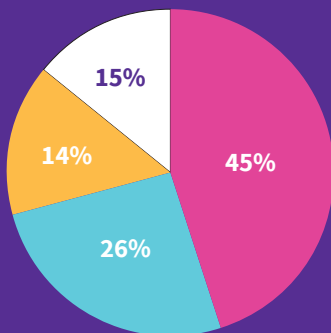


**24%** of patients are **NOT compliant** who are prescribed **MORE THAN TWO medications** to control their glaucoma



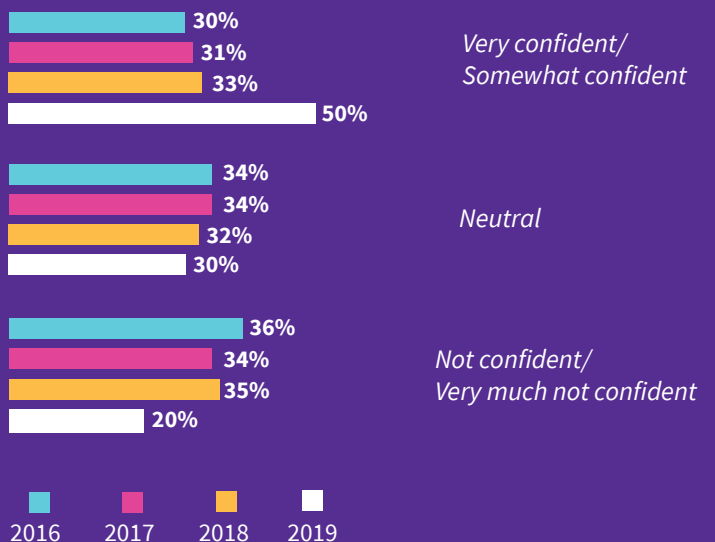
**57%** of respondents currently **use MIGS** or plan to **offer MIGS** in the **next 12 months**

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



- Yes, I perform glaucoma surgery and laser procedures
- Yes, I perform glaucoma surgery
- Yes, I perform glaucoma surgery laser procedures
- No, I only perform medical glaucoma practice

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



20% point increase in respondent confidence in performing MIGS procedures since 2016 survey



# Glaucoma Management & MIGS



By Boris Malyugin, MD, PhD

Respondents to the ESCRS 2019 Clinical Trends Survey reported seeing an average of 27 glaucoma patients per month; and an average of 12% of cataract patients were estimated to have glaucoma. The results show that 26% of patients prescribed one or two medications to control their glaucoma are not compliant, and 24% of those prescribed more than two anti-glaucoma medications are not compliant.

I believe that noncompliance among the glaucoma patients in my practice is around 20%; however, it varies significantly depending on the longevity of the disease, the number of drops to be used, and also the age and cognitive state of the patient.

In order to address a lack of compliance with patients, it is important to have a complete picture of their situation. For example, is the patient able to follow recommendations or should another person, such as a caregiver be involved? To improve compliance, it may be helpful to switch the patient to fixed combinations and preservative-free drops or consider laser procedures such as selective laser trabeculoplasty.

## WHICH SURGERIES AND WHEN?

Of the respondents' cataract surgery patients who are currently on topical therapy for their glaucoma, 13% are candidates for a minimally invasive glaucoma surgery (MIGS) device. More than half of respondents, 57%, either currently incorporate MIGS into their practice or plan to in the next 12 months. When it comes to surgery in general, both including MIGS and laser procedures, 26% of the respondents use these approaches for their glaucoma patients, 15% use the laser only and 14% perform surgery only. Almost half of respondents—45%— have a medical glaucoma practice and do not do surgery of any kind.

I have incorporated MIGS in my practice. Although the long-term effectiveness of different procedures varies significantly. One of the major advantages of the ab-interno MIGS procedures is that they prevent pressure spikes that may occur in cataract patients with glaucoma. These spikes can further damage the already compromised optic nerve head and lead to suboptimal functional results.

The ESCRS survey asked respondents at what stage of glaucoma management they choose to perform a surgical procedure: 48% said after three medications, 22% after two, 5% after a first line pharmaceutical, and 4% perform surgery as their first-line approach. When it comes to laser procedures, 22% initiate laser treatment after two medications, 18% after a first-line pharmaceutical, and 15% use laser therapy as their first-line treatment for glaucoma.

In my practice I initiate a surgical intervention to control glaucoma when medications fail to stabilize intraocular pressure (IOP). After first-line medications, my preferred second line treatment is a laser procedure after that I consider surgery.

“ In my practice I initiate a surgical intervention to control glaucoma when medications fail to stabilize intraocular pressure (IOP)

## MIGS GROWS IN POPULARITY

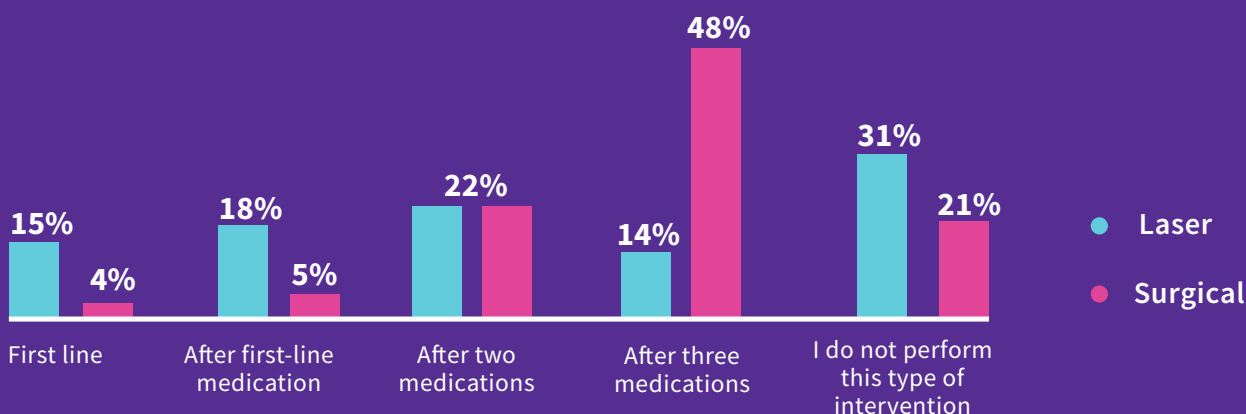
Half of the respondents to the ESCRS 2019 Clinical Trends Survey say they are very to somewhat confident performing MIGS procedures in their cataract patients with glaucoma, representing a 20%-point increase since the 2016 survey. About a third, 30%, said they were neutral and only 20% reported lacking confidence in MIGS.

Performing a MIGS procedure at the time of cataract surgery can benefit most patients with mild to moderate glaucoma. My preferred candidate for MIGS is a cataract patient who is on a maximal medication regimen with controlled or slightly elevated IOP.

## CONCLUSION

It is important to note that performing MIGS does not make a patient immune to pressure spikes. Moreover, MIGS does not treat the underlying cause for glaucoma, only its consequence of increased IOP. Therefore, glaucoma progresses and at some point surgeons will need to combine or add different treatments approaches such as laser therapy or even glaucoma surgery. My advice is to follow these patients and monitor them closely.

When do you usually **initiate intervention** for your **glaucoma patients**?



# Ocular Surface Disease & its Implications for Surgery

average number of **dry eye patients** seen each month



average percentage of dry eye patients that have **MGD** as a component of their dry eye



average percentage of cataract surgery patients who present for their preoperative consult with OSD symptoms (**13% point increase since 2016 survey**)



average percentage of cataract surgery patients who present as **asymptomatic of any OSD prior to surgery**, but develop symptoms postoperatively



## Timing of diagnostic testing:

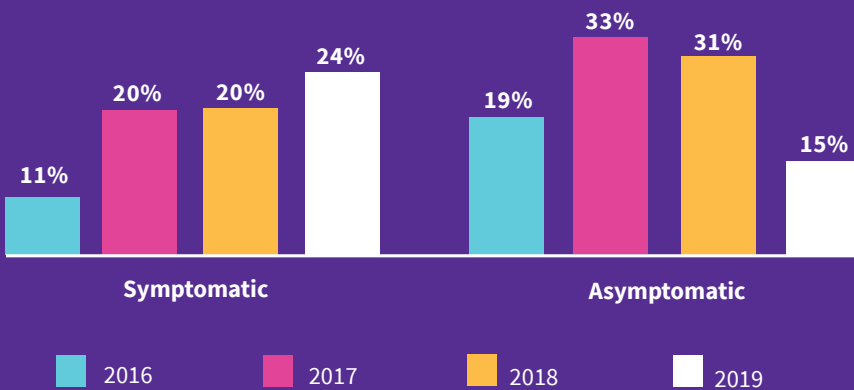
On a **case-by-case** situation, as decided during the consultation:

- 69% Schirmer's
- 62% Meibomian gland expression
- 50% Fluorescein staining/tear break-up time

At the **initial point of care**:

- 47% Fluorescein staining/tear break-up time
- 15% Dry eye questionnaire
- 5% Meibomian gland expression

## Symptomatic vs asymptomatic cataract patients with OSD by year



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

### Moderate dry eye

- Cyclosporin
- Topical corticosteroid
- Oral omega-3

### Severe dry eye

- Cyclosporin
- Punctal occlusion
- Oral omega-3
- Topical corticosteroid

### MGD

- Conventional/commercial warm compresses
- Meibomian gland probing

Are you **systematically checking** the ocular surface in your preoperative...

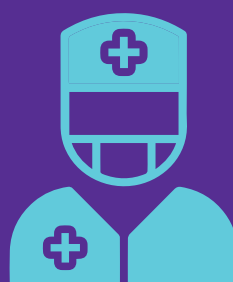
- Cataract surgery examination
- Laser vision correction

**3%** **6%**  
Rarely to never

**27%** **22%**  
Yes, in most cases

**23%** **12%**  
Only when the patient presents with dry eye symptoms

**47%** **60%**  
Yes, in all cases



# Ocular Surface Disease & its Implications for Surgery

By José Luis Güell, MD



The ESCRS Clinical Trends Survey found that respondents see an average of 46 dry eye patients per month, with 43% of the patients presenting with meibomian gland dysfunction (MGD) as a component of their ocular surface disease (OSD). An average of 24% of cataract surgery patients present for their preoperative consultation with OSD symptoms; this is a 13%-point increase since the 2016 survey. Further, the survey revealed that an average of 20% of cataract surgery patients, who present as asymptomatic of any OSD prior to surgery, develop symptoms postoperatively.

OSD is very common in our cataract population. In my estimation, about half of patients are asymptomatic before the surgery, but become symptomatic postoperatively. The incidence of symptomatic OSD increases with the age of the surgical candidate, and women account for approximately 70% of those complaining of symptoms after cataract surgery.

## SCREENING FOR OSD BEFORE SURGERY

When it comes to systematically checking the ocular surface in preoperative laser vision correction patients, 60% of the ESCRS Clinical Trends Survey respondents said they do for all laser vision cases, 22% do for most cases, 12% reported only checking the ocular surface when patients present with dry eye symptoms, and 6% said they rarely to never check. For preoperative cataract surgery patients, less than half—47%—said they always assess the ocular surface, 27% said they do in most cases, 23% said they do only when patients present with dry eye symptoms, and 3% said they rarely to never check the ocular surface.

At our institute, we screen patients preoperatively for OSD because we want them to be happy with their overall cataract experience as well as to achieve optimal visual results. Without proper evaluation for dry eye before surgery, the measurements—especially with toric lenses or when targeting a very specific outcome—can be less accurate.

## DIAGNOSTIC TOOLS

In the ESCRS Clinical Trends Survey, respondents were asked about the timing of the diagnostic tests they use to evaluate the ocular surface. The survey found that, on a case-by-case basis as decided during the consultation, 69% perform Schirmer tests, 62% do meibomian gland expression, and 50% use fluorescein staining and/or determine tear breakup time (TBUT). At the initial point of care, 47% of respondents do fluorescein staining and/or TBUT tests, 15% implement a dry eye questionnaire, and only 5% perform meibomian gland expression.

I perform a comprehensive slit-lamp examination, assessing the lid margins and conjunctiva for any abnormalities. If the result is normal, I proceed with the cataract workup. When results are abnormal, I perform corneal topography, ocular coherence tomography, endothelial cell count, biometry, and another slit-lamp exploration. In addition, I use a proper Schirmer test as well as ocular surface staining with fluorescein and lissamine green. I test osmolarity and in some cases, and when indicated I will also test for inflammatory factors.

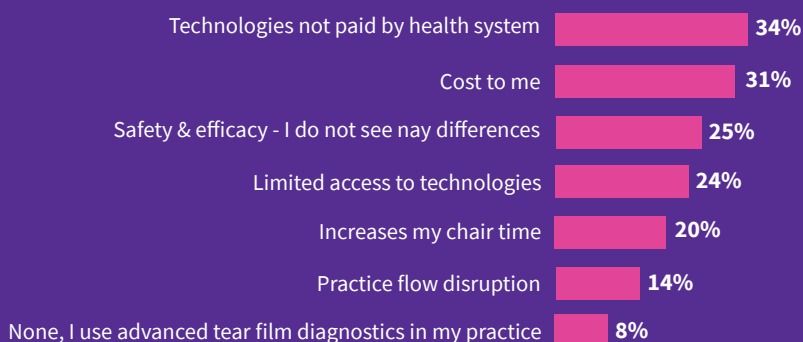
The ESCRS delegates surveyed were asked to note all applicable objections they have to including advanced tear film diagnostics in their practice, and 8% responded that they have no objections and do use these tests. Moreover, 34% said they objected to incorporating advanced diagnostics because the technologies are not paid for by the health system, 31% said it was because of the cost to the practice, 25% noted that they did not see any differences in terms of safety and efficacy, 24% have limited access to technologies, 20% objected due to the increase in chair time associated with the diagnostics, and 14% noted that the tests disrupt their practice flow.

## TREATMENT STRATEGIES

Survey respondents were also asked about their use of medications for treating OSD. The most commonly used therapies and treatments for managing moderate disease (beyond artificial tears and lid hygiene) were ciclosporine, topical corticosteroids, and oral omega-3 fatty acid supplements. For severe dry eye, ciclosporine still came out on top, followed by punctal occlusion, oral omega-3s, and topical corticosteroids. For MGD, the respondents most commonly implement conventional and/or commercial warm compresses and meibomian gland probing.

In the absence of inflammation and when the most significant factor is aqueous deficiency, I treat patients with artificial lubricating tears during the day and at bedtime to achieve normalization of the ocular surface. If the patient has a certain degree of inflammation but the lid margins appear normal at the slit lamp, I prescribe topical ciclosporin as the standard treatment. If the patient has any signs of lid margin inflammation or other lid disease, I proceed with thermal pulsation or laser to improve meibomian gland function. In special circumstances, there can be less obvious causes of OSD. In these cases, I may need to work in consultation with an internal medicine specialist or a dermatologist and perhaps prescribe oral antibiotic treatment. Patients with systemic disease such as Sjögren syndrome or other forms of vasculitis require a more aggressive approach with immunosuppressants and other treatments.

Key objections to including advanced tear film diagnostics in a practice: (select all that apply)



## CONCLUSION

I do not proceed with surgery until the ocular surface shows a significant improvement with a satisfactory TBUT measure. Then I can trust my preoperative measurements such as biometry and topography. Patients may still complain of symptoms despite a good TBUT, so I will proceed with surgery but continue with the most appropriate treatment for that patient after surgery. I want to diminish the risk for any complications related to the ocular surface as well as control postoperative symptoms.



**ESCRS**

EUROPEAN SOCIETY OF  
CATARACT & REFRACTIVE  
SURGEONS