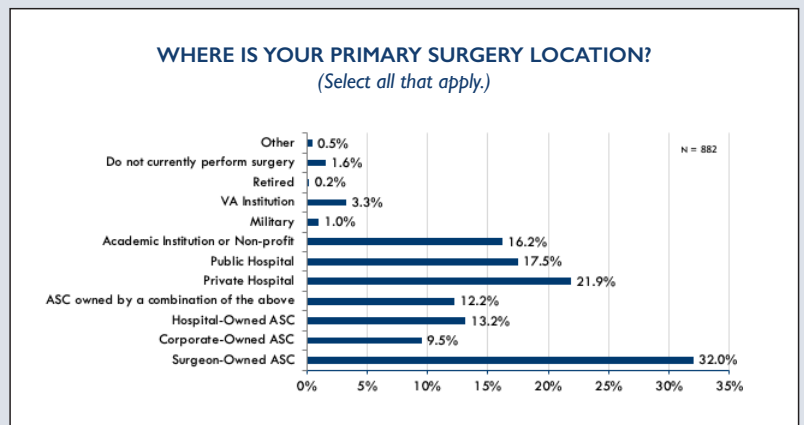
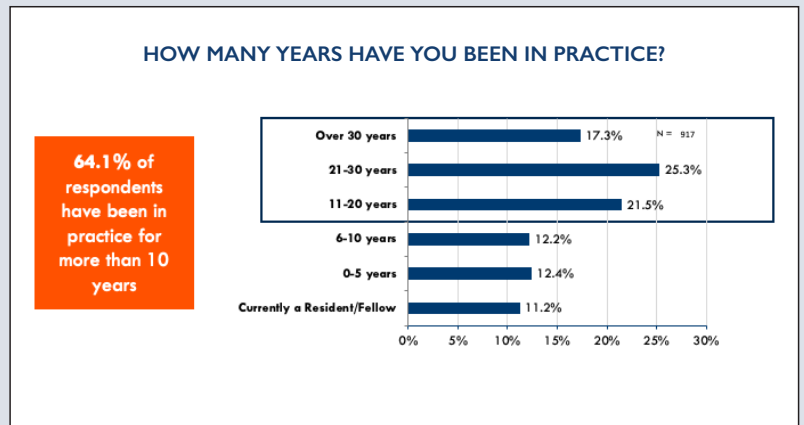
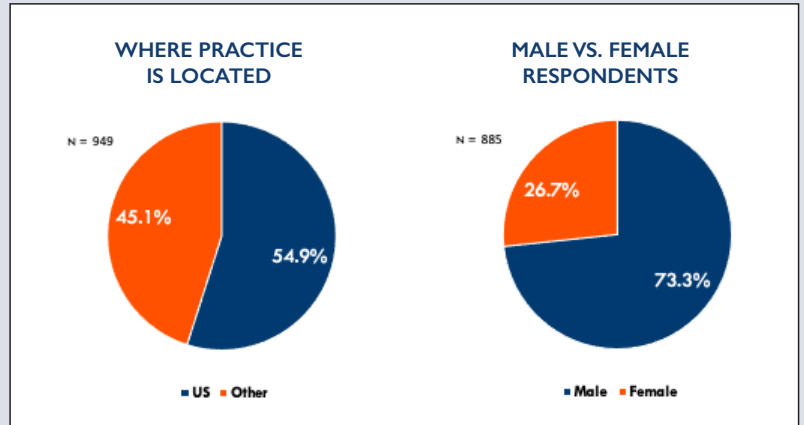


In 2019, ASCRS again conducted its Clinical Survey, which identifies education gaps by compiling data from respondents about their experiences across specialties. The survey included questions on cataract, refractive, cornea, glaucoma, and retina surgery. Information collected is used by ASCRS to guide educational initiatives and activities. The 2019 survey had 1,204 total ASCRS member respondents, with 54.9% practicing in the U.S. and 45.1% practicing elsewhere. Of the respondents, 73.3% were male and 26.7% were female. The survey respondents had a wide range of experience, from those currently in residency or fellowship (11.2%) to those who have been in practice more than 30 years (17.3%). The largest percentage of respondents was those who have been in practice 21–30 years (25.3%), and 64.1% of respondents have been in practice for more than 10 years. Respondents also varied in where they perform surgery, with the largest percentage (32%) performing surgery in a surgeon-owned ASC.



Cataract surgery

Respondents were asked about their level of confidence in customizing phaco machine settings to optimally manage various types of cataracts. Almost **73%** indicated they were **confident or very confident**, and only **7.8%** indicated they were “**unconfident**” (and 0.5% were not confident at all). Furthermore, **74.9%** indicated that they would be interested in **increasing their knowledge about phaco parameters**, while **25.1%** were **confident with their current understanding**.

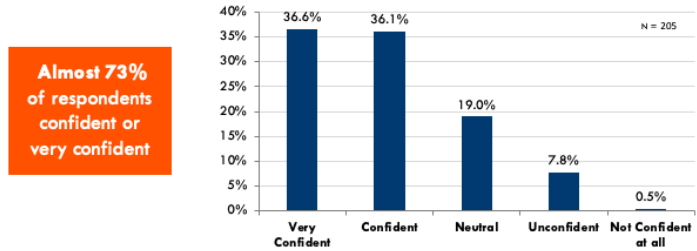
“There is a disconnect between how confident ophthalmologists report they are with customizing phaco machine settings to handle different cataracts (73% are either confident or very confident) and the number who are interested in increasing their knowledge (75%) regarding phaco settings.

“I have spoken to numerous phaco equipment representatives from many companies over the years, and I have heard the same thing again and again. The representatives will spend a day or two optimizing default settings for surgeons at a new installation. Then, if they come back a few years later, the default settings will be the same more than 80% of the time.

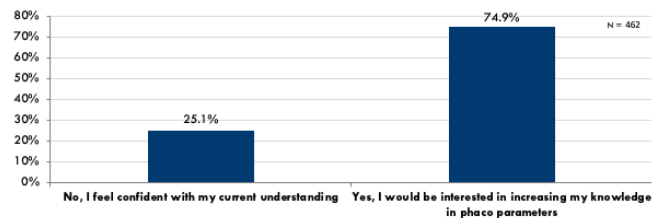
“This tells me several things. First, it tells me that ophthalmologists can get through most cases with default settings. This is actually a good scenario. None of us needs to understand the inner workings of a combustion engine to drive a car. So why should an ophthalmologist have to understand how a phaco machine works? It also tells me that ophthalmologists can make the ‘hammer’ work no matter what the ‘nail’ looks like. They will take longer, go slower, use more fluid, push farther down on the pedal, etc., but they will get through the case without changing the settings.”

Kevin Miller, MD
ASCRS Cataract Clinical Committee

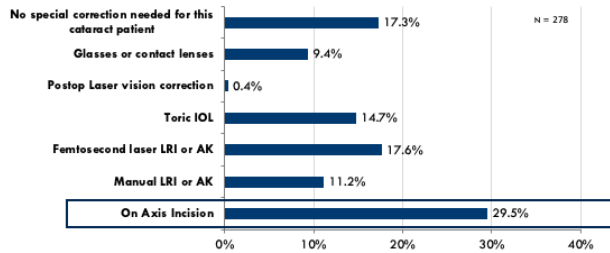
WHAT IS YOUR CURRENT LEVEL OF CONFIDENCE IN CUSTOMIZING YOUR PHACO MACHINE SETTINGS TO OPTIMALLY MANAGE VARIOUS TYPES OF CATARACTS?



WOULD YOU BE INTERESTED IN LEARNING MORE ABOUT CUSTOMIZING YOUR PHACO MACHINE SETTINGS TO OPTIMALLY MANAGE VARIOUS TYPES OF CATARACTS?



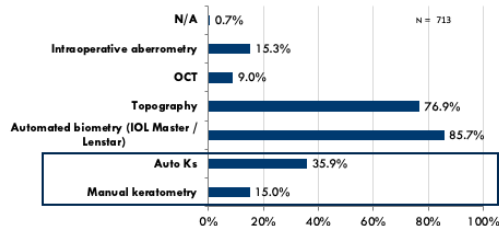
WHAT IS YOUR MOST COMMON PROCEDURE TO MANAGE WITH-THE-RULE ASTIGMATISM IN A CATARACT PATIENT WITH 0.75 D OF CYLINDER?



WHAT ARE THE PRIMARY PREOPERATIVE MEASUREMENTS THAT DRIVE YOUR ASTIGMATISM POWER AND AXIS DECISIONS WHEN IMPLANTING A TORIC IOL?

(Select all that apply.)

51% still using auto Ks and manual Ks as the primary measurement



Astigmatism management

The survey asked respondents about the most common procedure to manage with-the-rule (WTR) astigmatism in a cataract patient with 0.75 D of cylinder. The majority (29.5%) said they would use an on-axis incision. **Just over 17% said that no special correction is needed for this cataract patient, and 17.6% said they would use a femtosecond laser LRI or AK.**

When asked about the primary preoperative measurements that drive the surgeon's astigmatism power and axis decisions when implanting a toric IOL, **85.7% said they use automated biometry.** Additionally, **76.9% use topography.** The survey found that **51% of respondents were still using auto Ks and manual Ks as the primary measurement.**

"Virtually all patients who undergo cataract surgery have some amount of corneal astigmatism, but most don't have enough to warrant placement of a toric IOL. If a surgeon is comfortable moving around the eye, the easiest way to erase 0.3 to 0.5 D of astigmatism is to place the phaco incision on the steep axis. When placed superiorly, a standard 2.4 or 2.6 mm phaco incision will produce a greater effect than one placed elsewhere because the equatorial diameter is smaller in the vertical meridian and the incision is nearer to the center of the cornea. I typically get about 0.5 D of corneal flattening when I operate at 90 degrees. It doesn't matter whether the incision is made with a metal, diamond, or femto blade. The sweet spot for me postoperatively is to leave an eye with +0.3 D of WTR astigmatism. For someone with +0.75 D of WTR astigmatism, a phaco incision on-axis will produce a great result. A toric IOL could be used, but at greater expense. If a surgeon isn't comfortable operating superiorly, he or she could make a temporal incision and add relaxing incisions superiorly and inferiorly, but this is more work, and the final result will be less predictable.

"The gold standard for years for measuring corneal astigmatism had been corneal topography. A topographer sees the entire anterior surface of the cornea and not just 1 or 2 central rings, as you get with auto Ks, manual Ks, and optical biometers. Increasingly, however, corneal topography is being replaced by corneal tomography, which can generate a topography-like map from elevation data and which sees both the anterior and posterior surfaces of the cornea. Some corneas have considerable posterior surface astigmatism, to which topographers are blind. Intraoperative aberrometry can be a useful adjunct but cannot be used for planning astigmatism surgery without some other preoperative tool. Intraoperative aberrometry is blind to wound healing, as are all methods of measuring astigmatism."

Kevin Miller, MD
ASCRS Cataract Clinical Committee

Presbyopia correction

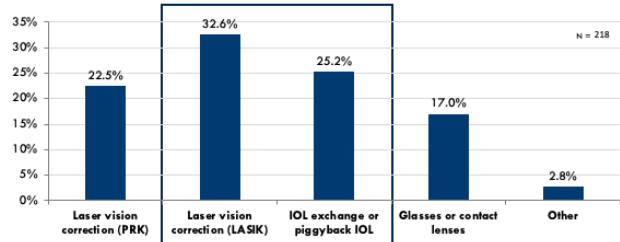
Survey participants were asked how they would most likely correct a presbyopia-correcting IOL patient who has -1.75 D of residual refractive error postoperatively and has some vision complaints, with **32.6%** indicating that they would use **laser vision correction (LASIK)**, **25.2%** indicating they would use **IOL exchange or piggyback IOL**, and **22.5%** indicating they would use **laser vision correction (PRK)**. Respondents also weighed in on the percentage of all cataract cases they plan for mini-monovision rather than performing a presbyopia IOL procedure. The largest percentage (**41.7%**) said they would use mini-monovision in **5–15%**, and **15%** was the overall average percentage of cataract cases planned for mini-monovision. Survey respondents were also asked about the percentage of all cataract cases they plan for “true” monovision, and **48.5%** said they plan “true” monovision for **5–15%** of all cataract cases rather than performing a presbyopia IOL procedure (**12%** was the overall average percentage of those choosing this option).

“It is interesting that if you add the mini-monovision and the monovision cases, they add up to 27% of cataract surgery. So not only is this a very popular option, it is the most common form of presbyopia correction at the time of cataract surgery. This is especially notable since the penetration of presbyopia-correcting IOLs is only about 8% in the United States.

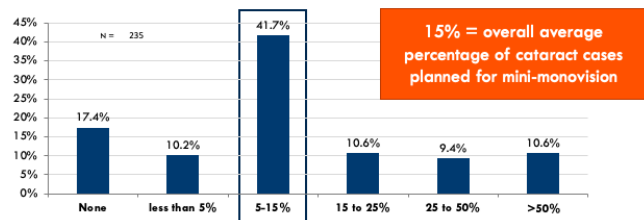
“I think piggyback lenses should be separated from an IOL exchange. They are two completely different procedures. These results may also be skewed by whether the physician performs laser vision correction. I would like to know that information and see those procedures broken down more specifically.”

Kendall Donaldson, MD
ASCRS Cataract Clinical Committee

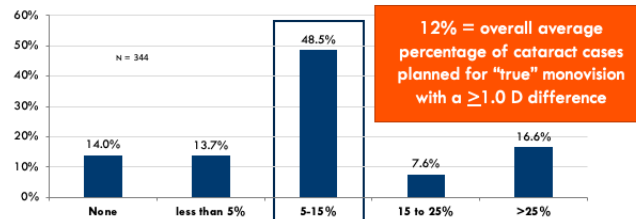
IF A PRESBYOPIA-CORRECTING IOL PATIENT HAS -1.75 D OF RESIDUAL REFRACTIVE ERROR POSTOPERATIVELY AND HAS SOME VISION COMPLAINTS, HOW ARE YOU MOST LIKELY TO CORRECT IT?



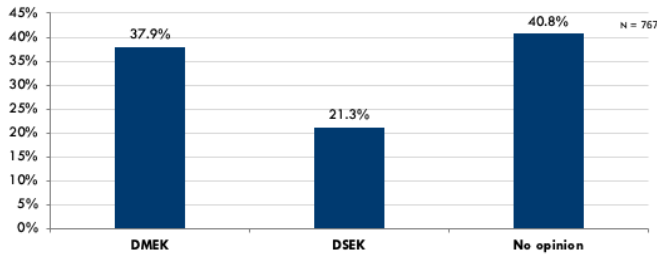
WHAT PERCENTAGE OF ALL CATARACT CASES DO YOU PLAN FOR MINI-MONOVISION, INSTEAD OF PERFORMING A PRESBYOPIA IOL PROCEDURE? (with less than 1.0 D difference between eyes post-surgery)?



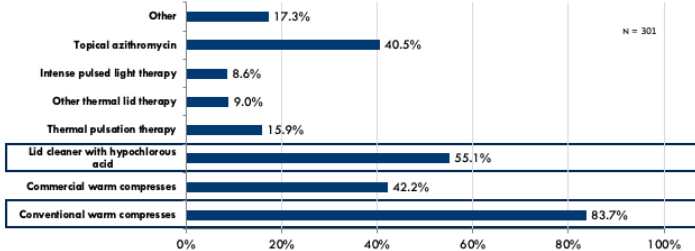
WHAT PERCENTAGE OF ALL CATARACT CASES DO YOU PLAN FOR “TRUE” MONOVISION, INSTEAD OF PERFORMING A PRESBYOPIA IOL PROCEDURE? (with 1.0 D difference or greater between eyes post-surgery)?



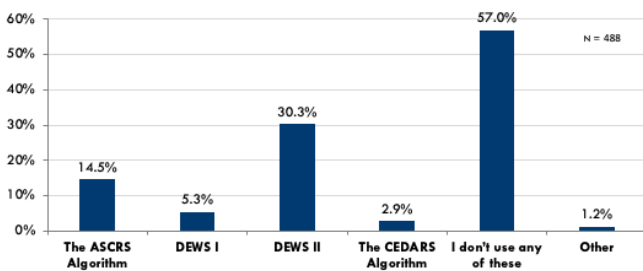
FOR A PATIENT WHO NEEDS A POSTERIOR CORNEA TRANSPLANT, IS YOUR PREFERENCE TO PERFORM/RECOMMEND A DMEK OR DSEK PROCEDURE?



FOR TREATMENT OF MEIBOMIAN GLAND DYSFUNCTION, WHICH OF THE FOLLOWING DO YOU EMPLOY? (Select all that apply.)



DO YOU USE ANY OF THE FOLLOWING GUIDELINES WHEN YOU ARE ASSESSING AND TREATING THE OCULAR SURFACE? (Select all that apply.)



Ocular surface disease

Ocular surface disease was also addressed in the survey, and respondents weighed in on their preference of either DMEK or DSEK for a patient who needs a posterior cornea transplant. While **40.8%** said they had “no opinion,” **37.9%** said they prefer **DMEK**, and **21.3%** prefer **DSEK**. Respondents were also asked about what they employ for the treatment of meibomian gland dysfunction and what guidelines they follow when assessing the ocular surface.

“I’m happy to see that the majority of respondents would recommend a DMEK. Although DSEK is an excellent technique and provides excellent vision and decreased risk, especially compared to a traditional PKP, I hope the trend continues and more would recommend DMEK moving forward. DSEK has its place, especially for my high risk, difficult, or complicated ocular conditions. DMEK has shown to provide reduced risk of rejection and overall more reliable and predictable postop refractive errors, which might be leading to improved vision. In my hands, DMEK, after a learning curve, is also a quicker procedure.”

“[For treatment of MGD], the slide shows some educational gains, such as using hypochlorous acid and topical azithromycin but also mixed with traditional treatments, such as conventional warm compresses. There is a small but growing compendium of independent (i.e., not industry-sponsored) studies showing the benefit and superiority of commercially available agents for thermal pulsation therapy, including those that might be fully automated, partially automated, or manual, and intense pulsed light therapy. Probably the fact that these devices are not reimbursed by traditional insurance and there needs to be a discussion with patients that involves a fee-for-service procedure has made them less attractive to the majority of providers. Furthermore, there’s typically a capital investment that again is for a fee-for-service procedure, which might seem risky to a practice not transitioned to this model.”

“I’m happy the newest algorithm, the ASCRS algorithm, is the second most commonly used guideline. The primary goal for the ASCRS Cornea Clinical Committee as we developed the algorithm was for members to have an easy, in-office algorithm that is a physician-extender driven, data-driven algorithm. Another goal was to highlight the critical importance of the ocular surface in outcomes surrounding any ocular surgery but especially anterior segment surgery.”

Francis Mah, MD
ASCRS Cornea Clinical Committee

Glaucoma

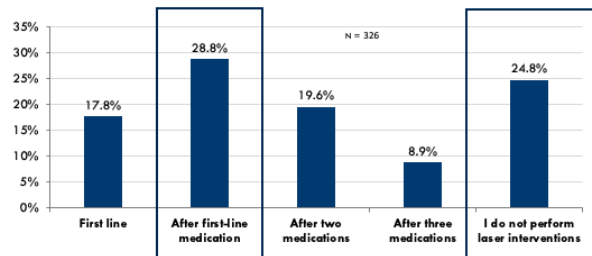
When asked when they most commonly initiate laser trabeculoplasty for glaucoma patients, **28.8%** of respondents said they use it **after first-line medication**, while **24.8%** said they **do not perform laser interventions**. Respondents also weighed in on which incisional glaucoma surgical procedures they perform, with the highest percentage (**48%**) saying that they **do not perform incisional glaucoma surgical procedures**; **36.6%** did perform trabeculectomy.

“The data shows that only 18% of respondents offer laser trabeculoplasty as a first-line option for their glaucoma patients. The recently published LiGHT study was a randomized controlled trial comparing eye drops vs. selective laser trabeculoplasty (SLT) as first-line therapy in glaucoma patients; 356 patients were randomized to SLT and 362 patients were randomized to drops, and patients were followed for 3 years. At the end of the follow-up period, none of the SLT-first patients required incisional glaucoma surgery, whereas 11 of the eye drop-first patients required glaucoma surgery. The results of the LiGHT study do suggest that a paradigm shift in the first-line management of our glaucoma patients is underway.

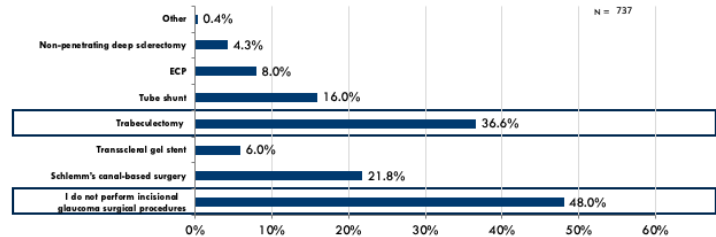
“I was surprised to see that more than one-third of the respondents said that they are performing trabeculectomy surgery, which is the gold standard glaucoma filtration procedure. By most accounts, fewer trabeculectomy procedures are being performed throughout the U.S., being replaced by glaucoma drainage device (GDD) procedures and MIGS. The main impetus behind the paradigm shift is the safer risk profile with GDD surgery and MIGS. These data are even more surprising given the fact that almost 70% of the respondents consider themselves cataract/anterior segment surgeons or comprehensive ophthalmologists. We do have an opportunity to teach MIGS techniques to our colleagues so that they might offer these less invasive procedures to their patients with mild to moderate glaucoma.”

Leon Herndon, MD
ASCRS Glaucoma Clinical Committee

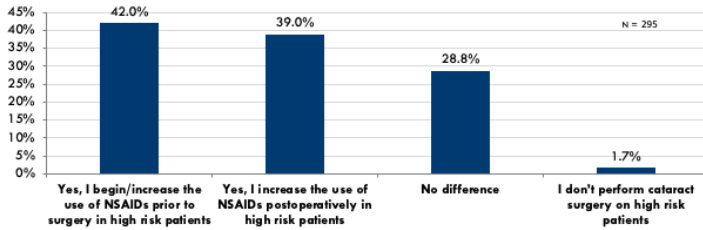
WHICH ANSWER BEST DESCRIBES WHEN YOU MOST COMMONLY INITIATE LASER TRABECULOPLASTY FOR YOUR GLAUCOMA PATIENTS?



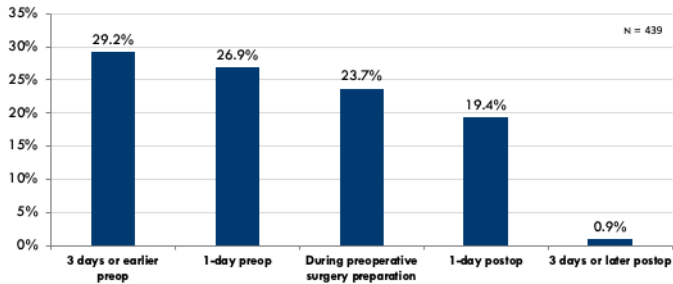
WHICH INCISIONAL GLAUCOMA SURGICAL PROCEDURE DO YOU PERFORM? (Select all that apply)



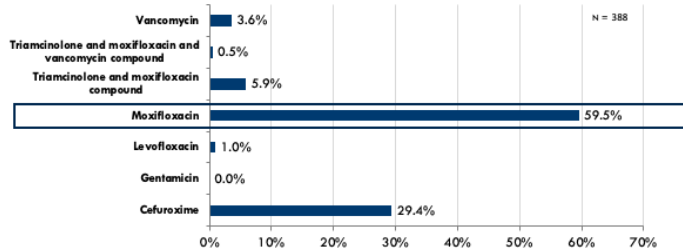
DO YOU USE NSAIDS DIFFERENTLY IN HIGH RISK PATIENTS VERSUS STANDARD PATIENTS? (Select all that apply.)



WHEN DO YOU BEGIN ANTIBIOTICS FOR A ROUTINE CATARACT SURGERY?



WHICH IS YOUR PREFERRED INTRAOPERATIVE ANTIBIOTIC INJECTABLE AGENT?



Inflammation/infection

Respondents were asked if they used NSAIDs differently in high risk patients versus standard patients, and 42% said they begin/increase the use of NSAIDs prior to surgery in high risk patients. Additionally, 39% said they increase the use of NSAIDs postoperatively in high risk patients. When asked when they begin antibiotics for routine cataract surgery, 29.2% of respondents said they begin 3 days or earlier preoperatively, while 26.9% said they begin 1 day preop. Speaking specifically about their preferred intraoperative antibiotic injectable agent, 59.5% of respondents preferred moxifloxacin.

"I don't find any surprises in these results [for NSAIDs being used in high risk patients versus standard patients]. The vast majority are increasing them in patients who are high risk or beginning them earlier in patients who are high risk. When you look at the numbers, it's almost 80%. I think there's some data that if you've got a patient who's at high risk for inflammation after surgery, if you start the NSAIDs prior and have them on more when you're doing the surgery, there may be a beneficial effect to keeping the inflammation from increasing right after the surgery or during the surgery.

"What I think you see [in terms of when to begin antibiotics for routine cataract surgery] is a spread. It's pretty much an even spread with people who are starting 3 days prior, 1 day prior, and just doing them during the preoperative period. We do antibiotics when the patient is in the preoperative area prior to surgery. The real data that's important is the data that's consistently shown the use of povidone-iodine on the eye preoperatively is helpful in sterilizing the surface of the eye.

"I think there's a lot of reasons why moxifloxacin is the most commonly chosen antibiotic to use intraoperatively. It has good coverage against the most common bacteria that can cause endophthalmitis. I think one of the other advantages is that it does come in a preservative-free form so that you can inject it safely intracamerally at the conclusion of the case without any worry about preservatives or other materials that can cause inflammation."

Nick Mamalis, MD
ASCRS Cataract Clinical Committee

Corneal refractive surgery

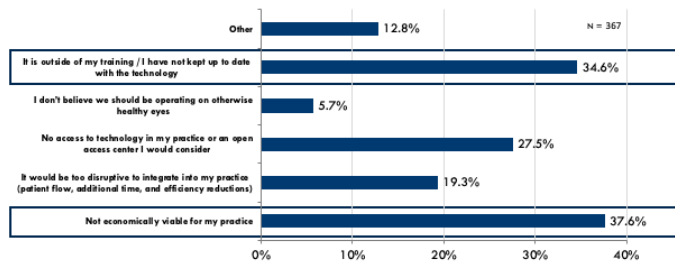
The survey asked about primary reasons for not performing corneal refractive surgery. The largest percentage (37.6%) said it was not economically viable for the practice, while 34.6% said it was outside their training or they had not kept up to date with the technology. When asked what has the least impact on the corneal biomechanical properties, 44% of respondents indicated SMILE (as compared to femtosecond flap LASIK), and 33.9% said they think there is no clinically significant differences between the two options. Refractive lens exchange was indicated by 53% to have the highest predictability in achieving the desired postop refraction in a 45-year-old hyperope.

“As a refractive surgeon whose practice foundation clinically, surgically, and economically is refractive surgery, I look at the 2019 ASCRS Clinical Survey feeling a bit melancholy. Daily I experience the joy that refractive corneal surgery can bring to the right candidates desiring less dependence on optical devices. I have witnessed fellow ophthalmic surgeons experience the joy and fulfillment of working hard to learn refractive surgery (including proper patient education) and subsequently experience the professional and personal satisfaction of meeting, or exceeding, their patient’s expectations. That same refractive surgery experience is also wonderful for optimizing cataract surgery refractive results, especially with modern day premium implants achieving such amazing results when refractive outcomes are optimized. In that context I am disheartened that 37.6% of survey participants said they are not performing corneal refractive surgery because it is not economically viable for their practice. Furthermore, this number goes up every year (32% in 2018 and 26% in 2017). Equally troublesome to me is that even though technology has gotten better, 34.6% think corneal refractive surgery is outside their training and/or they have not kept up to date with the advancements in knowledge and technology.

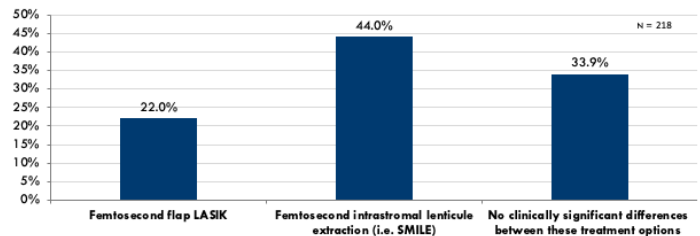
“I think we, and industry, owe it to our colleagues to teach and mentor our fellow ophthalmic surgeons on ways (clinically, surgically, and economically) to make this wonderful area of ophthalmology that is so impactful on patients’ lives more accessible to their practice.”

Vance Thompson, MD
ASCRS Refractive Surgery Clinical Committee

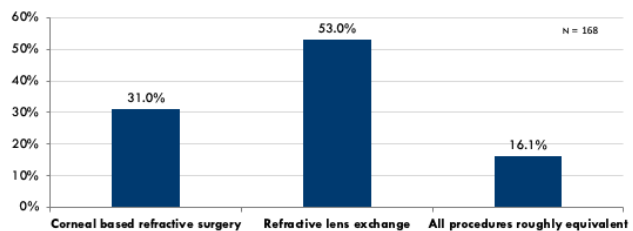
IF YOU ARE NOT PERFORMING CORNEAL REFRACTIVE SURGERY, WHAT ARE YOUR PRIMARY REASONS? (Select all that apply)



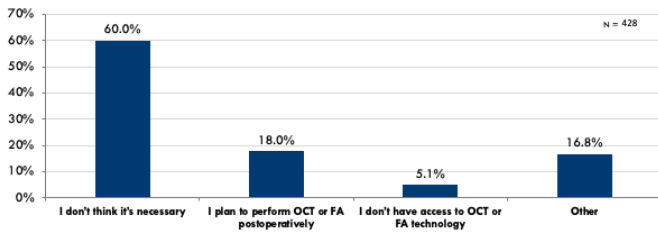
OTHER THAN SURFACE ABLATION, WHICH DO YOU THINK HAS THE LEAST IMPACT ON THE CORNEAL BIOMECHANICAL PROPERTIES?



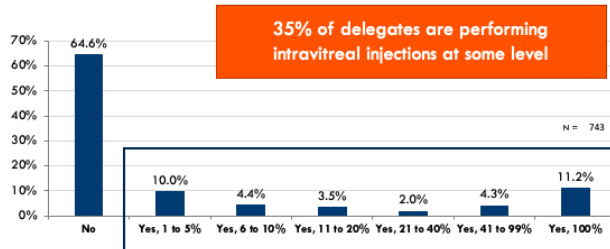
WHICH OF THE FOLLOWING PROCEDURES DO YOU THINK HAS THE HIGHEST PREDICTABILITY IN ACHIEVING THE DESIRED POSTOP REFRACTION IN A 45-YEAR-OLD HYPEROPE (+2.50 D)?



WHY DO YOU NOT PERFORM OPTICAL COHERENCE TOMOGRAPHY (OCT) OR FLUORESCHEIN ANGIOGRAPHY (FA) ON SOME PATIENTS PRIOR TO CATARACT SURGERY?



DO YOU PERSONALLY PERFORM INTRAVITREAL INJECTIONS FOR YOUR PATIENTS WITH MACULAR DEGENERATION, BEFORE, DURING, OR AFTER CATARACT SURGERY?



Retina

Respondents were asked why they do not perform OCT or fluorescein angiography (FA) on some patients prior to cataract surgery, and **60% indicated that they don't think it's necessary**. Respondents were also asked if they personally perform intravitreal injections for patients with macular degeneration before, during, or after cataract surgery. While **64.6% did not, 35% were performing these injections at some level**.

"While I agree that an FA may not be necessary for every patient prior to cataract surgery, the value of a preoperative OCT cannot be overemphasized. In general, the patient population affected by cataracts is similar in age to that affected by common retinal pathologies, including macular degeneration. Overlooking a potentially vision-impacting retinal condition can lead to unanticipated poor postoperative results, and the patient may even blame your surgery for their unmet expectations.

"Even if you perform a careful dilated funduscopy examination, findings such as epiretinal membranes and subtle cystoid macular edema can be missed, especially in the presence of a dense cataract. It takes just seconds to obtain an OCT with current technology, so if you have the capability, do it. And if you don't have access to an OCT machine or don't prefer to interpret images yourself, the patient can easily be referred to a retina colleague who will send the patient back to you.

"For those who responded that retinal imaging is not necessary in this setting, consider that several studies have found significant proportions of patients to have occult retinal disease detected on OCT that was not identified on exam. Personally, I have seen cataract surgery patients in the immediate postoperative period with a variety of conditions—everything from wet macular degeneration to retinal detachment that was almost certainly present preoperatively.

"[Regarding whether physicians perform intravitreal injections for patients with macular degeneration before, during, or after cataract surgery,] there are two issues embodied in this question—one concerning the treatment of wet macular degeneration in the context of cataract surgery and the other regarding who administers intravitreal injections for these patients. In terms of timing of injections in the perioperative period, it is ideal to schedule the surgery 1 or 2 weeks following an injection. However, if not possible, I personally do not alter a patient's injection schedule. The only caveat is that I try not to inject during the first few postoperative days when the wound may still be unstable.

"When it comes to administering intravitreal injections, the complexity resides less in the injection itself and more in what comes before and after it. Confirming accurate diagnosis, selecting and adjusting treatment regimens, interpreting nuanced OCT findings, and managing serious injection-related complications, should they occur, are paramount in the proper management of wet AMD. As retina specialists have received dedicated training to develop these skillsets, they are the best equipped to perform intravitreal injections. There are certainly situations where this may not be feasible; in these cases where a non-retina specialist is the one injecting, co-management and close communication with a retina specialist may be prudent."

Christina Weng, MD
ASCRS Retina Clinical Committee