One to Watch: Alanna Nattis, DO

Dr. Nattis is a cornea, cataract, and refractive surgeon at Lindenhurst Eye Physicians and Surgeons in Babylon, New York.

PLEASE SHARE WITH US YOUR BACKGROUND.

I grew up in Long Island, New York, and from an early age was fascinated with small, intricate details. As a child, this interest mainly translated to bedazzling fabrics, but, when I entered school, I found a natural appreciation for and understanding of the complexities of the sciences, particularly biology. In college, I decided to pursue a career in medicine, as it incorporated my love for biology and physiology and my desire to treat and connect with patients. Additionally, growing up watching my father, an ophthalmologist, examine and successfully medically and surgically improve patients’ vision and quality of life left a lasting imprint in my mind for the career direction I would choose.
WHAT DREW YOU TO OPHTHALMOLOGY AND, SPECIFICALLY, TO YOUR FIELD OF INTEREST?

Upon entering medical school, I was innately drawn to ophthalmology, not only by my experiences watching my father but also because I found the eye so fascinating. No other organ seemed to match the anatomic, physiologic, or pathologic intricacies of the eye. Having the opportunity to do multiple ophthalmology rotations as a medical student further cemented my passion for the field, especially anterior segment surgery.

In no other specialty can a surgeon improve a patient’s quality of life through improvement of vision in a single sitting (and that extends from cataract surgery, to LASIK, to laser capsulotomy!). In addition, the privilege of performing corneal transplantation in patients across all ages and demographics is amazing. The ability to restore sight to a patient with a scarred, irregular cornea; see the results at the slit lamp; and hear how treatment has enhanced the patient’s quality of life is beyond gratifying.

PLEASE DESCRIBE YOUR CURRENT POSITION.

I am currently a cornea, cataract, and refractive surgeon at Lindenhurst Eye Physicians and Surgeons in Babylon, New York. This is a multispecialty practice with a focus on refractive, cataract, cornea, and anterior segment surgery as well as vitreoretinal disease and pediatric ophthalmology. Our practice is dedicated to obtaining and offering the newest technologies to our patients, including femtosecond laser cataract surgery, new IOL designs, intraoperative aberrometry, topography-guided laser refractive surgery, and corneal crosslinking (CXL) for keratoconus, to name a few.

In addition, I am able to offer corneal transplant surgery to patients in the practice, which was a needed niche to fill on the South Shore of Suffolk County on Long Island. Since I started practicing in July, we have successfully performed the first Descemet stripping automated endothelial keratoplasty at Good Samaritan Hospital in West Islip as well as several penetrating keratoplasties.
WHO ARE YOUR MENTORS?

My most important mentor is my father, Richard Nattis, MD. He has been the most encouraging, supportive, and amazing example of an ophthalmologist I can imagine. At every step along the course of my training, he has been a resource for clinical advice as well as ways to optimize my learning of new technologies and techniques.

In addition, my cornea fellowship mentors, Drs. Eric Donnenfeld and Henry Perry, provided me with the most in-depth, intense cornea, cataract, and refractive experience in 1 year’s time. The amount of information I learned and pathology I observed—both clinically and surgically—was remarkable, and I am very grateful for the opportunity to be trained by and to work alongside these experts.

WHAT HAS BEEN THE MOST MEMORABLE EXPERIENCE OF YOUR CAREER THUS FAR?

The most memorable experience thus far was my first day at work in practice with my father. All the training, studying, and (sometimes) grueling hours had led up to that point. The example my father set is a major reason why I chose to pursue a career in ophthalmology, and being able to work with him side by side is wonderful.

WHAT ARE SOME NEW TECHNOLOGICAL ADVANCES THAT YOU HAVE FOUND PARTICULARLY EXCITING? WHICH ADVANCES IN THE PIPELINE ARE YOU MOST ENTHUSIASTIC OR CURIOUS ABOUT?

One technological advance I am very interested in and passionate about is topography-guided ablations (ie, LASIK and PRK). This technique focuses on not only treating refractive error but also treating corneal irregularities during surface ablation and LASIK procedures. Even more exciting is the potential this technique has for providing significant visual improvement in patients with keratoconus and post-LASIK ectasia who have undergone CXL.

Last year at the ASCRS annual meeting, we presented a study on visual outcomes for keratoconus patients after CXL and topography-guided PRK, the results of which were very
promising. I hope to continue to expand on this research in order to provide further visual improvement to these patients. I am also interested in the different CXL techniques (eg, accelerated and customized) as well as new advances in refractive cataract surgery, especially astigmatism management.

**WHAT IS THE FOCUS OF SOME OF YOUR RESEARCH?**

My research interests are broad and range from refractive surgery to dry eye treatments. Recently, I became involved in a project investigating treatment guidelines for meibomian gland dysfunction and *Demodex* blepharitis. Dry eye and blepharitis are intertwined entities that lead to both frustrated patients and physicians. Often *Demodex* blepharitis isn’t thought of as a diagnosis, but it is actually quite prominent. Here, treatments such as mechanical cleansing techniques as well as tea tree oil may be helpful.

In addition, I plan to continue my research on refining visual outcomes in patients with keratoconus and post-LASIK ectasia after CXL. Now that CXL is approved by the FDA, I feel we can really reshape these ectatic corneas and provide substantial improvements in vision and therefore quality of life.

**WHAT IS A TYPICAL DAY IN YOUR LIFE? WHAT KEEPS YOU BUSY, FULFILLED, AND PASSIONATE?**

Each day is different, but every day I go to work my focus is the same: to provide the most comprehensive, compassionate, and technologically innovative care to my patients. I try to educate my patients about their conditions, whether it is explaining posterior vitreous detachment or corneal edema in need of transplantation. Taking the time to ensure that patients understand their conditions and treatment plan enforces a strong patient-physician relationship and helps with compliance.

My practice spans from corneal disease, to refractive and cataract surgery, to general ophthalmology. Seeing a wide variety of pathology keeps me busy and on my toes—and fuels my desire to do better each day. When I’m not at work, I spend as much time as
possible with my family and friends (including my dachshund, Lily). They help keep me sane and are truly my source of encouragement and happiness. In addition, I make time for working out and enjoy traveling (especially to beach destinations) when time allows.

**WHAT ADVICE CAN YOU OFFER TO INDIVIDUALS WHO ARE JUST NOW CHOOSING THEIR CAREER PATHS AFTER FINISHING RESIDENCY OR FELLOWSHIP?**

The best advice I can give to anyone transitioning from training to a career in the “real world” is to treat your patients as you would your family. Imagine how it would feel to be on the other side of the slit lamp, fearing that you may lose your vision. Comfort and speak to your patients—and educate them—in the same way you would someone close to you; this will keep you grounded, especially in tough or challenging situations. Once you have a strong foundation and have established good patient-physician relationships, all of the extraneous (but also important!) activities, such as research, publishing, and social media, can be accomplished more easily.

I also recommend setting realistic goals for the first year of practice. The realization that you are the only one responsible for your actions/surgeries/conversations with your patients comes very quickly once you have finished training and entered practice—whether you stay in academics or go into a private setting.

**TELL US ABOUT AN INNOVATIVE PROCEDURE YOU ARE PERFORMING OR A NEW IMAGING/DIAGNOSTIC TOOL THAT HAS IMPROVED YOUR PRACTICE.**

Over the past few years, innovation in ophthalmology has exploded. It is hard to pick one treatment or technology that seems more interesting or effective than the others, but one procedure I am performing in practice that has had a huge impact is CXL. As screening for keratoconus and ectasia becomes more prevalent, the need for CXL is increasingly apparent. Having become familiar with the procedure during my fellowship, I am proud to be able to offer our patients CXL to help halt progression of their disease, preserve their vision, and improve their quality of life.
Outstanding Female Leader in Ophthalmology: Leela Raju, MD

Dr. Raju is Chief of the Ophthalmology Service at Bellevue Hospital and a Clinical Associate Professor at NYU Langone Health in New York, New York.
I grew up in Morgantown, West Virginia. My parents moved there in the late 70s, as my father, VK, was recruited to West Virginia University’s ophthalmology department after his cornea training in London. My parents both grew up in India, where my mom, Rani, earned a master’s degree in English before joining my dad in London; this meant grammar was corrected at school ... and at home. My brother, Ashok, and I were very lucky that she was able to spend so much time with us, as we both played competitive tennis growing up. This led to my attending Brown University, where I was on the varsity team.

I went to Marshall University for medical school and then completed residency and a cornea fellowship at the University of Pittsburgh and Baylor University, respectively. I returned to the University of Pittsburgh, where I served as Vice Chair for a couple years, before trying out the world of private practice in Brooklyn, New York. However, I found I missed the camaraderie and atmosphere of academics and joined New York University about a year ago.

Throughout all this I have been involved in international outreach with the Eye Foundation of America (EFA), a nonprofit my father started when he first came to the United States. I travel frequently to India, where we help support an eye hospital, the Goutami Eye Institute, that has strong community and school-children screening programs and is screening and treating all the premature babies in the area. EFA also supports a very active program in Ghana, which I was fortunate to visit in October.

**WHAT IS THE FOCUS OF YOUR CURRENT RESEARCH?**

I feel that herpes simplex virus is underdiagnosed and has a greater morbidity than realized. I am working to prove what I think many cornea specialists do based on anecdotal evidence: utilize both oral antivirals and topical steroids to prevent recurrent episodes leading to vision loss. I also have a strong clinical interest in ocular surface disease and stem cell transplantation as well as international ophthalmology and the impact of preventive ophthalmic interventions in developing countries.
WHAT HAS YOUR EXPERIENCE BEEN COLLABORATING WITH INDUSTRY?

I think nurturing the ability to exchange ideas between physicians and industry is an important part of moving ophthalmology forward. I have been lucky to meet industry members who were interested in learning about what is needed on the clinical side and my feedback on what is presently available. I also do a lot of volunteer work internationally, and the industry’s generosity is always amazing.

IN YOUR OPINION, HOW IS THE ROLE OF WOMEN IN OPHTHALMOLOGY EVOLVING?

The fact that women now make up almost half of residencies shows that the makeup of the future of ophthalmology is going to be different. I expect to see even more women as key opinion leaders and in leadership positions as time goes on.

WHAT, IF ANY, HURDLES DO YOU FEEL WOMEN IN HEALTH CARE STILL FACE?

Being a doctor takes a great deal of your time, even when you’re not in front of a patient. The ability to find the appropriate time for other important aspects of your life—family and friends; other responsibilities related to your job; sleep; your interests that make you, you—may end up getting pushed aside. This is an issue with any job, but many women may feel the family portion of their life often depends mostly on them, and there are only so many hours in the day. The other thing that many of us many not want to think about as often is the fact that we are typically paid less or reimbursed less than our male colleagues; while there has been a lot of debate as to why, perhaps it’s more important for us to start realizing we need to start making sure we’re getting paid for the quality work being done. Asking the questions can’t be taboo.

WHAT ADVICE CAN YOU OFFER TO YOUNG FEMALE OPHTHALMOLOGISTS WHO ARE STILL IN TRAINING OR JUST BEGINNING THEIR CAREERS?

Seek out mentors—men or women—and don’t be hesitant about asking for the things you’re interested in, whether it’s becoming involved in teaching, joining a committee, or being considered for an administrative position. I think there are still a lot of assump-
tions that women may not want the responsibility for something outside of patient care, so we may need to start asking for it. But we also need to be able to realize when we may be spread thin and are doing things that aren’t helping us be better doctors or people and be able to say no. It’s a fine line.

**CAN YOU PROPOSE A UNIQUE OR CREATIVE IDEA THAT MAY HELP WOMEN IN OPHTHALMIC PRACTICES?**

It’s not terribly creative, but I would reach out to other women who you think have accomplished or are working toward what you’d like to do. See if you can bounce ideas off each other. We should use our collective brain power to make work more fun and effective where possible.

**PUBLISHED WORKS**

Raju VK, Raju LV. Musings on Medicine, Myth, and History: India’s Legacy. Morgantown, Virginia: Eye Foundation of America; 2017.


Kowalski RP, Karenchak LM, Raju LV, Ismail N. The verification of nucleic acid amplification testing (Gen-Probe Aptima Assay) for chlamydia trachomatis from ocular samples. Ophthalmology. 2015;122(2):244-247.


**PROFESSIONAL SOCIETY MEMBERSHIPS**

- American Medical Association | 1999 to Present
- American Academy of Family Practitioners | 1999 to 2003
- American Academy of Ophthalmology | 2005 to Present
- Pittsburgh Ophthalmic Society | 2005 to 2014
American Society of Cataract and Refractive Surgery 2006 to Present

Association for Research in Vision and Ophthalmology 2006 to 2008

Pennsylvania Academy of Ophthalmology | 2010 to 2014

HONORS AND AWARDS

- Resident Teaching Award, University of Pittsburgh | 2012

- Senior Resident Research Award, University of Pittsburgh | 2008

- Spurlock Fellowship, Mary Babb Randolph Cancer Center, West Virginia University | 1996

Four Steps to Toric IOL Calculation Success

New evidence-based rules to conquer astigmatism at the time of
If you use a 1.00 D cutoff to decide between a toric IOL and limbal relaxing incision (LRI), like I did for many years, then good news—you can significantly improve your outcomes with four new rules of astigmatism management.

In the past few years, much has changed in our understanding of astigmatism planning during cataract surgery. I call it the Age of Astigmatism Enlightenment (Figure 1). Thanks to Drs. Doug Koch, Graham Barrett, Warren Hill, and others, many longheld practices and beliefs have been debunked or updated. Using these updated guidelines can significantly increase toric IOL accuracy and result in 80% to 90% of patients ending up with less than 0.50 D of residual cylinder.
Let’s take an example case. A 68-year-old woman desires clear uncorrected distance vision after cataract surgery. Her topography (Figure 2) reveals 0.78 D of with-the-rule (WTR) astigmatism at 92°. Automated keratometry reveals 1.00 D at 94°, and the Lenstar (Haag-Streit) keratometry reading is 0.85 D at 97°.

![Topography Diagram](image)

**Figure 2.** The patient’s topography revealed 0.78 D WTR astigmatism at 92°.

Just a few years ago, I would have entered these figures into either the Alcon or Abbott Medical Optics toric calculator, plugged in 0.40 D for surgically induced astigmatism (SIA) at 180°, and then been recommended a ZCT150 (Figure 3A) or SN6AT3 (Figure 3B) to be placed WTR. And I would have likely been really off. But we’re smarter now.
Figure 3. Toric calculators recommending a ZCT150 (top) or SN6AT3 (bottom) to be placed WTR would have been incorrect. For better results, check off the “Include Posterior Corneal Astigmatism” box on the Tecnis IOL calculator, and use the newer Alcon Toric Calculator incorporating Barrett, instead of the older calculator shown here.
FOUR NEW RULES OF ASTIGMATISM MANAGEMENT

Account for Posterior Corneal Astigmatism
We now know that our keratometry measurements only measure the anterior
corneal curvature and that we need to account for hidden posterior corneal
astigmatism. To be accurate with toric IOLs, we need to under-treat anterior WTR and
overtreat ATR astigmatism.

Posterior corneal astigmatism can either be measured directly or estimated by theoreti-
cal formulas. Preoperatively, we can attempt to measure the posterior cornea (and hence
total corneal astigmatism) by some Scheimpflug topographers such as the Pentacam
(Oculus) and Galilei (Ziemer), LED topography such as the Cassini (i-Optics), and soon
swept-source OCT.

Posterior corneal astigmatism can also be theoretically accounted for with the Baylor
nomogram or the Barrett Toric Calculator. Finally, intraoperative aberrometry can also
measure the eye’s total astigmatism when done in the aphakic state, helping with toric
IOL magnitude selection. To date, the most accurate methods appear to be the theoreti-
cal models such as the Barrett Toric Calculator.

USE THE BARRETT TORIC CALCULATOR.

Until recently, we had always been advised to ignore the refractive cylinder and only use
keratometry to calculate for torics. However, it turns out that if a patient has significant
refractive against-the-rule (ATR) cylinder and only, say, 0.40 D of keratometric ATR
cylinder, then we should expect extra posterior corneal cylinder and chose a higher toric
IOL power to treat it.
Use a Centroid Value of 0.10 D for SIA

In the past, when entering SIA into our toric calculators, we usually estimated 0.30 D to 0.50 D based on calculations assessing the mean change in absolute keratometry. Some of us dutifully calculated our own mean SIA. And for years, many of us operated on the steep axis.
It turns out that our most consistent results are with a temporal clear corneal incision. We have learned that entering a centroid value of 0.10 D, which takes into account the vector of astigmatism, gives the best results to all surgeons operating temporally—surprisingly with little significant variance for incisions between 2.20 D and 2.75 D.
Consider Long-Term Astigmatic Drift

Hayashi\(^1\) has studied and reported on the long-term drift of astigmatism. In most people, WTR will drift to ATR at an average rate of 0.34 D per decade. So, if one targets 0.35 D of WTR residual astigmatism, the patient should be in great shape for at least 20 years or more.

Axis Flipping Is Perfectly OK

When prescribing glasses, the common wisdom is to proceed with extreme caution if flipping an axis. This led earlier calculators to recommend IOLs that left more residual cylinder, to avoid axis flipping. We now know, however, that flipping a small amount of cylinder is tolerable and actually preferable when treating ATR astigmatism. On the other hand, we shouldn’t have to flip for WTR cylinder, as we want to leave some residual WTR.

LRI VS TORIC IOL

Existing studies\(^2,3\) show that toric IOLs are more accurate and stable than LRIs, so we
should use torics whenever we can. In the United States, we have access to the T3 (Alcon) and ZCT150 (Johnson & Johnson Vision) and their presbyopia-correcting cousins; both the T3 and ZCT150 treat approximately 1.00 D of corneal cylinder, depending on IOL power.

Applying the rules above, I generally place a toric IOL for WTR astigmatism greater than 1.50 D and ATR greater than 0.40 D. I use femtosecond laser LRIs for the rest. Today, I personally calculate and refine my toric selection using the Barrett toric calculator and LED topography measurements, peeking at the refraction, and I utilize ORA (Alcon).

**CONCLUSION**

In the case described above, the new Barrett Toric Calculator with an SIA of 0.10 D recommends against a toric IOL. My Cassini total corneal astigmatism measurements also revealed only 0.61 D of WTR cylinder. I therefore applied paired penetrating femtosecond LRIs at 90°. ORA guidance was then used to refine by opening up the LRIs (with a Sinskey hook) to further reduce the cylinder to about 0.40 D. The patient ended up with 20/20 uncorrected vision and a plano -0.50 X 180 refraction.

With good use of our astigmatism enlightenment tools, best practices have reported more than 90% of eyes within ±0.50 D of residual cylinder. Also, I’ve noticed that since the cataract patient demographic is older, I tend to have much more ATR cylinder to treat; most of those patients get a toric IOL, so the toric eligible rate can approach 50% in many cataract practices.


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