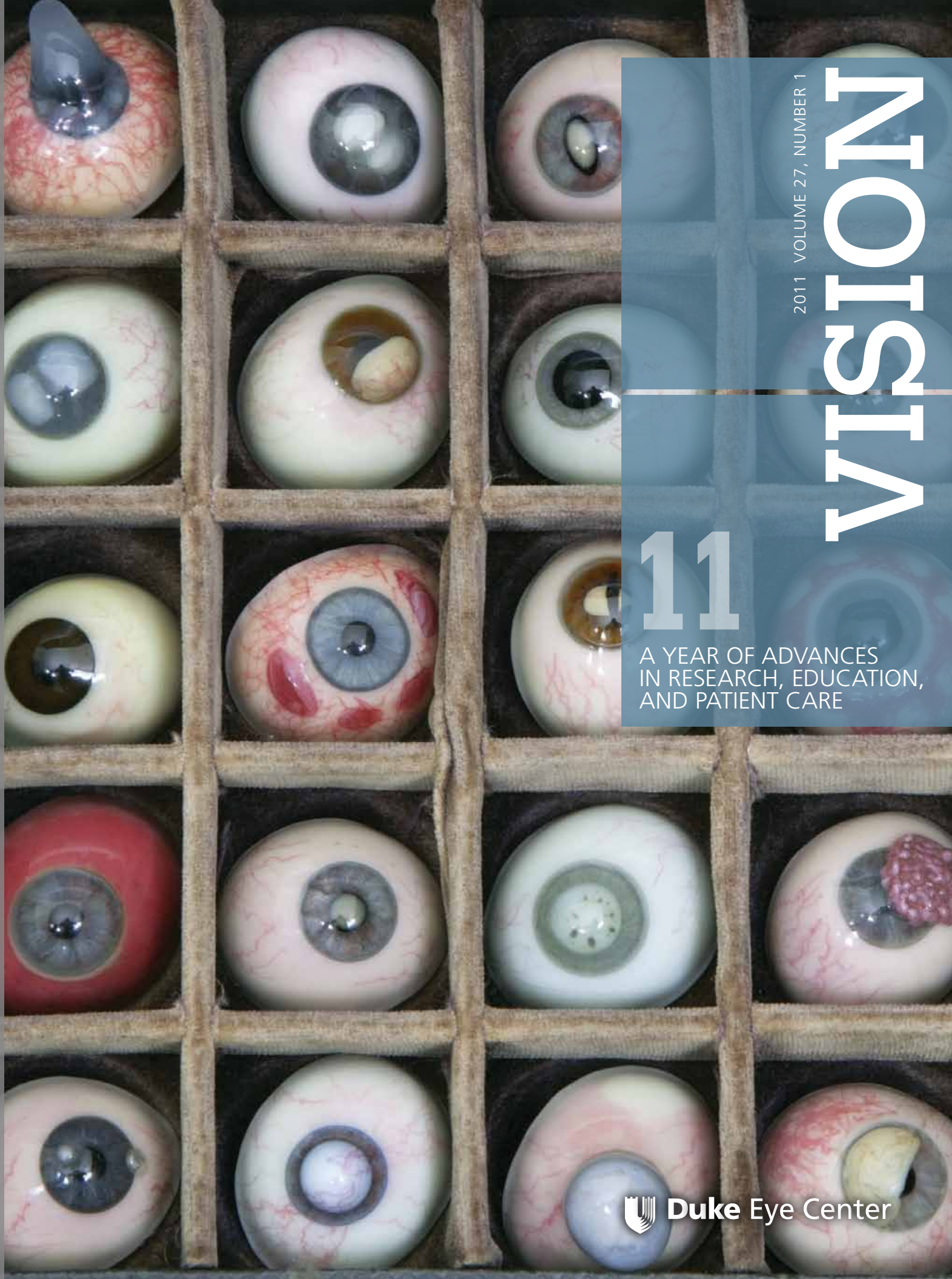

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VISION

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A YEAR OF ADVANCES IN RESEARCH, EDUCATION, AND PATIENT CARE

Duke Eye Center

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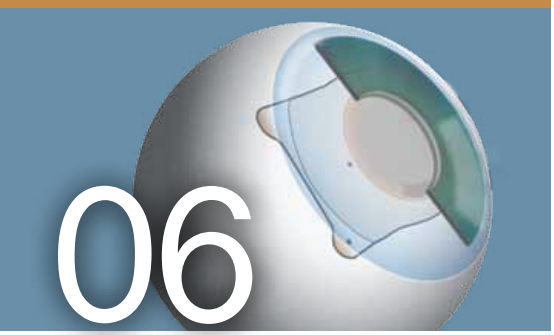
New Duke Sports Vision Center of Excellence

VISION CORRECTION SURGERY
ICL: Going beyond LASIK



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ON THE COVER
Dunn's model eye kit, manufactured by F. Davidson of London around 1900. The kit was used to teach medical students about the appearance of different eye conditions. These models include bloodshot eyes, burst corneal blood vessels, cataracts, defects of the iris, defects of the pupil, and eye tumors or growths.

Q&A with David L. Epstein

THE EYE CENTER PAVILION WILL ALLOW US TO SET UP CENTERS OF CLINICAL EXCELLENCE FOR MANY SUBTYPES OF EYE DISEASE.

How will the new Pavilion change the way the Eye Center operates?

The practice of medicine is vastly different today than it was 40 years ago, which is when our current clinical building, the Wadsworth Building, was designed. The new Eye Center Pavilion is being designed to support the way we wish to practice at the Eye Center today: it will be focused on the patient, not only to provide the most modern eye care technology, but also to minimize the need for visiting patients to travel to multiple locations—which is what they must do today in Wadsworth.

The Eye Center Pavilion will facilitate longer interactions between our physicians and their patients, more efficient care, and less patient waiting. Most patients do not realize that in the Wadsworth Building there are not enough examination rooms for the physicians, technicians, fellows, and residents to see their patients. This room shortage will be eliminated with the new building.

The building will also enable us to conduct meaningful clinical research on the latest developments in eye care, and to better train the next generation of ophthalmologists. We have many visitors from across the country and the world who come to learn and observe us in the Duke Eye Center, and we currently have insufficient space for this.

Our faculty is internationally renowned and has true expertise in specialized areas, and the Eye Center Pavilion will enable us to set up Centers of Clinical Excellence for many subtypes of eye disease. In summary, the new building will allow us to fulfill our mission and credo: For any type of eye or visual problem, we are able to deliver eye care that is second to none, and we are committed to the discovery of truly innovative new cures for all potentially blinding eye diseases.

What is most inspiring to you about the people who make up your Eye Center faculty, staff, and students?

Our faculty, staff, and trainees are outstanding people in their human qualities, their desire for knowledge and innovation, and their extraordinary collegiality.

We have had a strong tradition of outstanding residents in ophthalmology for decades. But now, each year, the residents seem smarter and smarter (I hope it is not me getting dumber and dumber!). These are truly impressive young men and women, but what is especially different is their inquisitive spirit—their desire for new discoveries combined with true excellence in clinical care.

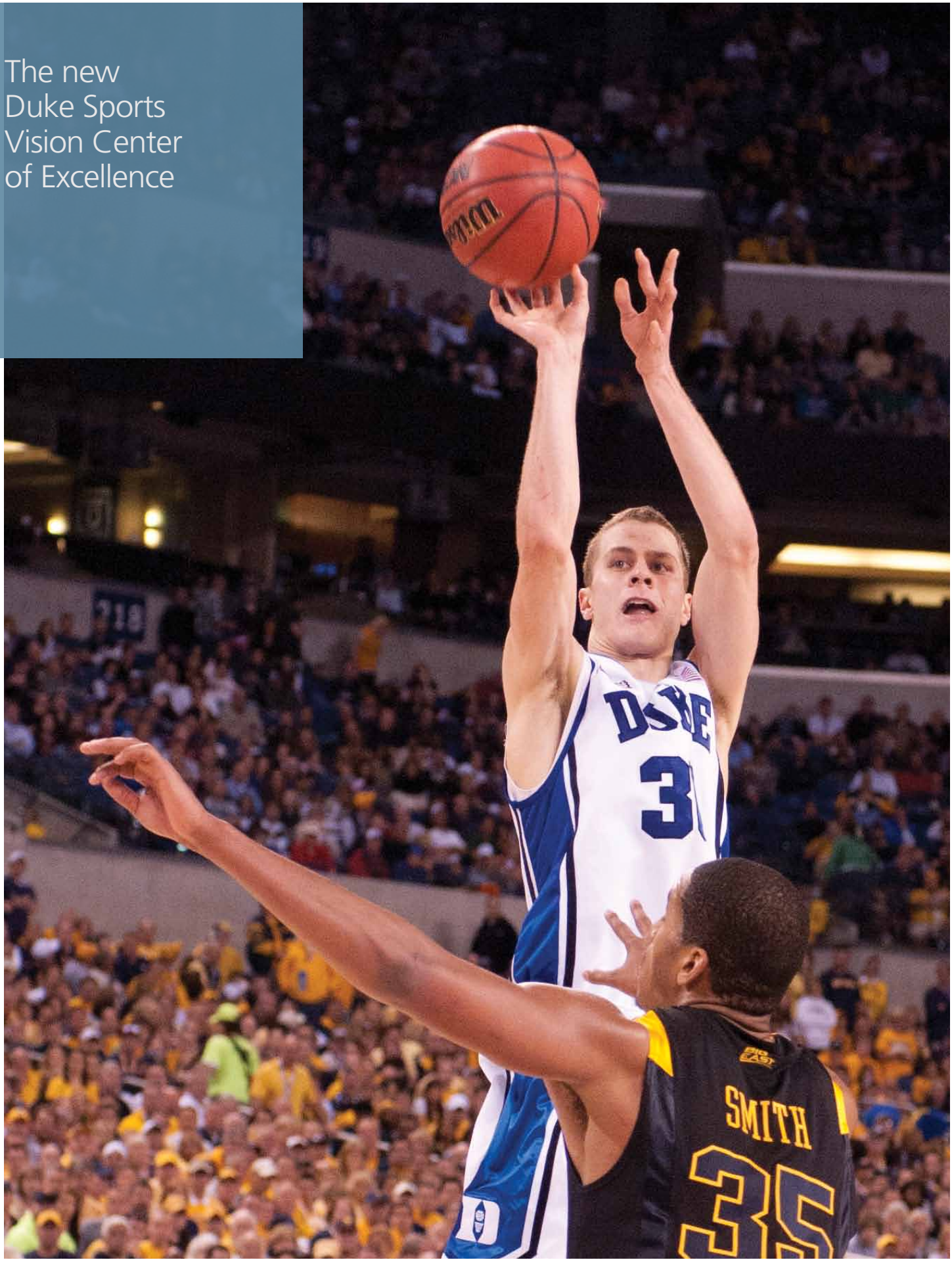
We have a very large faculty of somewhere around 68 clinicians and academicians, and it represents a "big tent"—there is a wonderful balance of empowerment, a federal-type decentralized leadership, good humor, and friendship. I truly believe the faculty, staff, and trainees all generally like each other and respect each other. There is a strong emphasis on delivering eye care of unsurpassed quality, and there is a passion about training the next generation of ophthalmologists who are both innovators and leaders.

But to me the most impressive aspect of the environment is that it is a bubbling cauldron of inquisitiveness and new ideas. Everyone, from the trainees to the faculty, realizes that we need further advancements in eye care for still-persisting, potentially blinding eye diseases. It will happen at Duke! I am so proud of the faculty, staff, and trainees who truly represent the best of Duke's values.

David L Epstein, M.D.

David L. Epstein, MD
Chair, Department of Ophthalmology

The new Duke Sports Vision Center of Excellence



Jon Scheyer helped lead the Duke Blue Devils to their 2010 NCAA basketball championship.

Scheyer with Terry Kim, MD, head of the new Duke Sports Vision Center of Excellence, and Duke men's basketball coach Mike Krzyzewski, who encouraged the center to treat members of the military as well as athletes.

EYES ON THE BALL

On July 13, 2010, Duke ophthalmologist Terry Kim's phone rang, and on the other end of the line was former Duke basketball player Jon Scheyer, who in his senior year had helped lead the Blue Devils to the 2010 NCAA basketball championship. Kim had examined Scheyer's eyes every year since he joined the team as a freshman. On the phone, Scheyer didn't sound like himself. He told Kim that while he was working out with an NBA Summer League team, another player had poked him in the eye. Then he put the team doctor on. The doctor said that Scheyer showed signs of optic nerve damage—a very serious injury.

After a career–changing eye injury, Scheyer turned to his Duke ophthalmologist for guidance.

Kim couldn't believe it. Optic nerve damage usually happens with serious trauma, like a car accident. Eye pokes happen all the time in basketball, and they usually aren't that big of a deal. Scheyer was about to fly to Chicago to be with his family, so Kim put him in touch with a friend and fellow ophthalmologist Kirk Packo, MD, in Chicago, who the next day confirmed the bad news. Scheyer had a very severe injury, called a partial optic nerve head avulsion, that would likely cause a permanent decrease in vision and visual field.

Kim knew this type of injury could be devastating for Scheyer's hopes of a pro basketball career. He flew to Chicago the next day to see Scheyer and his family himself.

"When I had my eye injury, the first person I called was my trainer from Duke to get ahold of Dr. Kim," Scheyer says. "He is the only eye doctor I've seen my whole life. Since he flew out to Chicago to see me in the hospital, he has guided me through my recovery process. He has been not only a great doctor to have but a great friend as well."

In Chicago, Kim examined Scheyer's eyes and spent the entire day with him and his family, explaining that the injury was serious but that it was too soon to tell

Kim says the new center will help standardize treatment and follow-up for eye injuries—and it will focus heavily on prevention, education, and research.

the extent of Scheyer's vision loss. "Not once did Jon cry. He showed such determination to do everything he could to make this better and to accept the consequences," Kim says. "To see Jon, barely out of college, face this potentially career-threatening eye injury with such maturity and optimism really impressed me."

Scheyer's determination in the face of this injury inspired Kim to take the first steps toward developing the Duke Sports Vision Center for Excellence to offer diagnosis, treatment, and support for athletes of all levels with eye injuries and eye diseases. Whereas in the year and a half after his injury Scheyer saw 14 different doctors in six different states, Kim envisions the new Duke center as a one-stop location providing diagnosis and treatment of problems of the optic nerve, cornea, lens, retina, and eyelids or orbit. Low-vision rehabilitation services would also be offered at the center, which Kim hopes could be located in the new Eye Center Pavilion that will open in 2014.

Duke basketball coach Mike Krzyzewski and his wife, Mickie, who are supporters of the center, suggested extending the services to members of the military. "Athletes and military members have extraordinary talents and need extraordinary vision to use their talents," Kim says. "They both have to function at a higher level than the average person." Kim sees a need to standardize treatment and follow-up of eye injuries and diseases for this special group of people.

Injury prevention education as well as research would be part of the mix too. Many athletes, including children, don't wear protective eyewear, and many sports leagues don't require it. Education could help change that. Kim also sees the center as a natural place to conduct peer-reviewed research regarding recovery rates from serious sports-related eye injuries, as well as evaluation of new devices, such as "vision training" aids that purport to improve hand-eye coordination.

Formal support groups for athletes and military members with eye injuries will round out the center. After Scheyer was injured, he heard that a player for the Baylor University women's basketball team had just suffered a similar blow. He contacted her to offer his support. "I just wanted to tell her that there was someone out there who had a similar injury and could answer any questions she might have. When I first had my injury, I didn't know of many instances of other basketball players getting injured in the eye. When you're going through a tough time, it's great to have a couple of people you can lean on," Scheyer says.

One finger poke changed Scheyer's life; he lost much of the sight in his right eye. But it hasn't kept him from basketball. After completing vision rehabilitation (he says adjusting to his changed depth perception was the biggest challenge), Scheyer landed a spot with the Rio Grande Valley Vipers, the NBA development league team for the San Antonio Spurs. He started in 19 of their 24 final games, averaging more than 13 points in 33 minutes of action per game. The team advanced to the finals of the league's championship. "I don't want this injury to slow me down. Because of this injury, I've met so many people who are completely blind, or blind in one eye. Mine isn't the best situation, but mine isn't the worst either," he says.

Scheyer is now beginning a new challenge as shooting guard for Maccabi Tel Aviv, a team in Israel's Super League, which is a member of the Euroleague. "When I got injured, I remember being on the ground and feeling pretty scared. I told myself that when I can get back and am allowed to play, I'm gonna give it everything I have," he says. "Now when I go out and play, I'm playing for that person on the ground."

Kim and Scheyer hope the new Duke Sports Vision Center for Excellence will help many other athletes have equally triumphant outcomes. "There's such a great need for a center like this," Scheyer says. "I've been able to see the best eye doctors in the world, between Dr. Kim and my specialists in Chicago and Memphis. But for people who aren't as lucky as me, there's a need to have one place where they can go to get the best care and support."

> "When I got injured, I remember being on the ground and feeling pretty scared. I told myself that when I can get back and am allowed to play, I'm gonna give it everything I have. Now when I go out and play, I'm playing for that person on the ground."
>
> // JON SCHEYER

Identical twins are helping Eye Center doctors search for the causes of **Fuchs dystrophy**

At almost 90 years old, Virginia T. Bailey of Rocky Mount, North Carolina is just 15 minutes older than her sister, Scott Hughes, of Durham. As identical twins, they are almost the same person, genetically speaking. But it's not hard to tell them apart. The sun has weathered Bailey's face more than it has her sister's. And while Bailey is a card, joking with her cornea specialist, Natalie Afshari, MD, Hughes is charming but more reserved.

The interplay between genetics and environment can also be seen in the sisters' eyes. Bailey doesn't drive anymore because of vision loss caused in part by Fuchs dystrophy, a common disease of the aging cornea. She has already had a cornea transplant, which is the treatment recommended once the disease progresses enough that daily activities are affected. Hughes has Fuchs dystrophy too, but she is still able to drive. She's in a wait-and-see phase; she may get a transplant if her disease progresses.

Fuchs dystrophy is one of the leading reasons for the 40,000 corneal transplants that are performed annually in the United States. Its causes are unknown, though scientists suspect it has a genetic component. The twin sisters were two of more than 800 people with Fuchs who participated in a study that Afshari and colleagues have been conducting to try to pinpoint specific genetic causes of this disease of the aging eye. The study, which investigated the genetics of Fuchs in the largest number of people to date, confirms the findings of a previous investigation that showed that a common genetic variant is associated with the disease. The study was published April 2011 in the journal *PLoS One*.

Hughes asked her nieces, nephews, daughter, and other (non-twin) sister to have their DNA examined for the study, and they agreed. "We were delighted to participate in the study," Hughes says. "If we can do anything to help find a cure, we are glad to." The inclusion of family members is important because few studies to date have examined the genetics of entire families. Because the disease doesn't emerge until later in life, sometimes patients don't have parents or even siblings who are alive to be tested.

The ultimate goal of the genetics studies is to learn enough about the causes of the disease to find a way to stop it before it progresses, making cornea transplant unnecessary. The genetic variant identified by the Duke study provides a promising clue, but it wasn't present in all participants with the disease. So Afshari is beginning work with colleagues from Johns Hopkins and Case Western University to conduct a multi-center, genome-wide association study to find other genes that may be involved in Fuchs. Afshari's team is still recruiting participants, both with Fuchs Dystrophy and without. "We are looking at all the DNA in the human body, basically trying to find a needle in a haystack—to find the genes that contribute to this disease," she says.

In the meantime, Bailey benefited from a relatively new corneal transplant procedure called the Descemets Stripping Endothelial Keratoplasty (DSEK), in which, instead of removing the entire thickness of the cornea and replacing it with a donor cornea, only one layer of the cornea, the cloudy endothelial layer, is replaced with donor cells. "Instead of changing the whole wall of the cornea, we are just putting in new wallpaper, while leaving the good part of the wall," Afshari says. This operation usually results in a shorter recovery time for the patient and carries less chance of rejection of the donor cells.

Virginia T. Bailey (center) and her twin sister, Scott Hughes, are helping Duke ophthalmologists Natalie Afshari, MD (left), and Sharon Fekrat, MD, study Fuchs dystrophy.

Because specialists at Duke Eye Center see so many Fuchs patients, Duke has performed more than 1,500 DSEK surgeries, more than any other academic institution in the country. Duke also performed the first pediatric DSEK procedure.

LASIK AND BEYOND

ALAN N. CARLSON, MD, is considered one of the premiere LASIK surgeons in the country and is one of only two physicians in North and South Carolina certified to train other physicians in LASIK.

But, for close to 40 percent of his patients, he chooses a different option.

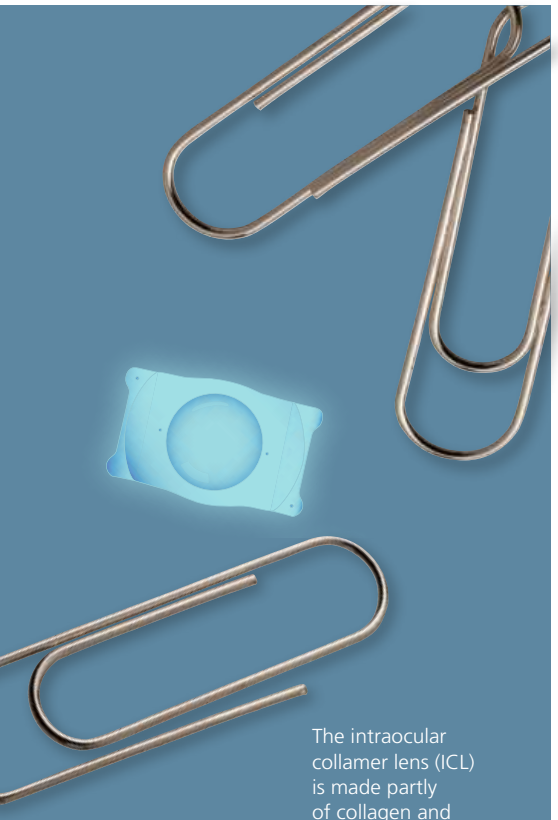
"LASIK has been a mainstream procedure for correcting astigmatism for 15 years. It's still a very viable option, and incremental improvements over the years have only made it more so," Carlson says. But a number of other procedures have emerged, and Duke Eye Center offers the most advanced ones.

"We've never had more options for patients," Carlson says.

He says patients choose to come to Duke Eye Center because Duke tailors treatment to individuals and offers a thorough screening with a surgeon before the procedure. "Unlike the typical LASIK shops, which approach each patient with one question: 'Are they a candidate for LASIK, yes or no?' at Duke we are asking, 'What is the best procedure for this patient?' Patients actually meet their surgeon on the day of their testing, not simply the day they are having surgery. They get the opportunity to go over their surgical options with their surgeon during the preoperative screening. That's a huge advantage that Duke offers," Carlson says.

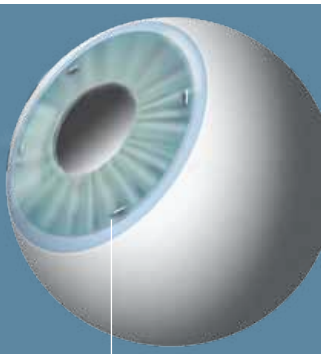
Among the new procedures offered is the implantable collamer lens (ICL), which is made partly of collagen and is implanted on top of the cornea. ICL may be a better choice for people who need a high degree of vision correction, because drastically reshaping the cornea, as with LASIK, makes it thinner and weaker, making patients more prone to reduced contrast sensitivity. The military has embraced ICL for correcting vision since it enables soldiers to avoid the hassle of contact lenses in dry, arid, and dusty climates, yet it doesn't run the risk of weakening the cornea.

The collamer lens also gives Carlson the ability to operate on both eyes



The intraocular collamer lens (ICL) is made partly of collagen and implanted behind the cornea, no reshaping required. An ICL is between 12.1 and 13.7 millimeters long after it unfolds in the eye (shown here in relation to the size of a standard paper clip).

ICL



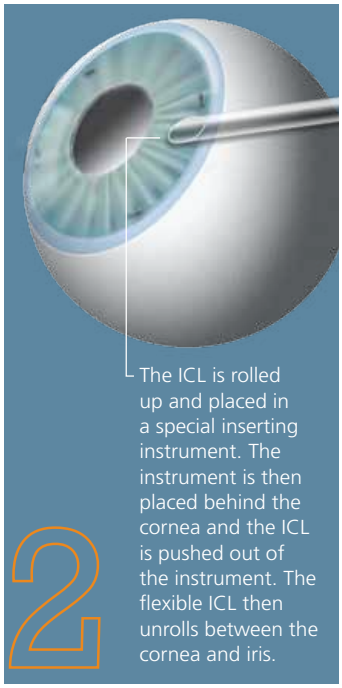
1 Once anesthesia is applied, four micro incisions are made at the base of the cornea that will be used to position the ICL.

> "Unlike the typical LASIK shops, which approach each patient with one question: 'Are they a candidate for LASIK, yes or no?' at Duke we are asking, 'What is the best procedure for this patient?'"
>
> // ALAN CARLSON

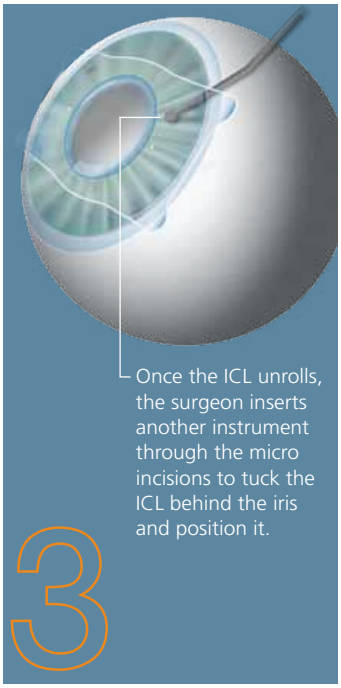
on the same day using only topical anesthesia. The incision required for the lens is tiny, because it's folded up when implanted, then unfolds to its full width after implantation. The incision requires no stitches.

Many of the newer intraocular lenses provide a larger range of vision so patients are less dependent on glasses after surgery. This is true even for patients with cataracts. For instance, John Sandfort of New York was extremely nearsighted; his vision had been described as 20/2000. He had worn thick glasses since he was a child. Then, at age 62, he developed cataracts. He came to Duke for cataract surgery because he had some retinal problems in the past and had heard Duke was the best. "John is not simply a cataract patient but presented issues related to having a profound refractive error of -26 Diopters and previous retinal surgery—all requiring special attention and not simply seeing him as a LASIK or cataract patient," Carlson says.

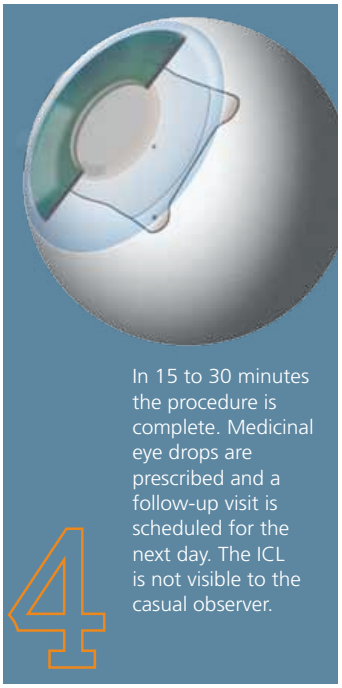
Sandfort is beyond happy with the results he got from the lens replacement that Carlson performed. He no longer needs glasses. "Since my cataract surgery I am seeing better without glasses than I ever did in my whole life with glasses," Sandfort says. "It has empowered me. I used to let my wife drive everywhere, and now I am the one driving. The care at the Duke Eye Center was first rate."



2 The ICL is rolled up and placed in a special inserting instrument. The instrument is then placed behind the cornea and the ICL is pushed out of the instrument. The flexible ICL then unrolls between the cornea and iris.



3 Once the ICL unrolls, the surgeon inserts another instrument through the micro incisions to tuck the ICL behind the iris and position it.



4 In 15 to 30 minutes the procedure is complete. Medicinal eye drops are prescribed and a follow-up visit is scheduled for the next day. The ICL is not visible to the casual observer.

Do glaucoma patients need help taking their eye drops?

For now, the only way to prevent vision loss in patients with glaucoma is to make sure they use their prescribed eye drops, which reduce pressure inside the eye. Many patients' vision worsens despite this treatment. Duke glaucoma specialist Kelly Muir, MD, suspects one reason may be that patients don't always take the eye drops as prescribed. "Some patients need the drops multiple times per day, but they're easy to forget since the patients don't feel worse if they don't take the drops, nor do they feel any better if they do," Muir says.

Muir is attempting to discern whether lack of adherence is truly a problem through a pilot study of glaucoma patients at both the Durham Veterans Affairs Hospital and Duke Eye Center. She will track how often patients take their drops using prescription records as well as prescription bottles equipped with electronic caps that note the day and time whenever the bottle is opened.

To enroll a patient in this study, call 919-684-3283.

eye & mind

IN 2005, WHEN HEATHER WHITSON, MD, was a fellow in geriatrics at Duke, her grandmother was diagnosed with macular degeneration. Her grandmother had been a college professor, a world traveler, and a pilot. But vision loss made it impossible for her to even drive a car. On top of that, she began to develop cognitive impairment. "Vision impairment and memory impairment are a really bad combination," Whitson says. "My grandmother had a little watch that would tell the time out loud. But she was always misplacing it. If you can't see where you put something, and you can't remember where you put it, then you're in bad shape."

All the things that your eyesight enables you to do—read, work a crossword, fix a lawnmower engine—also feed your brain. So it's not that surprising that people with macular degeneration, the most common cause of age-related vision loss, have greater rates of cognitive impairment than people of the same age who have normal vision. Whitson, now a faculty member in the Departments of Medicine and Ophthalmology, and other scientists at the Duke Eye Center have published some of the most detailed data available documenting cognitive deficits among patients with macular diseases, and now they've designed a low-vision rehabilitation program especially for people with cognitive impairment.

Whitson has always been interested in how seemingly unrelated conditions—for instance, depression and osteoporosis—can work together to worsen an older person's ability to function. Her grandmother's diagnosis in 2005 made her think about the link between macular degeneration and cognitive impairment, and she discovered that other scientists had found that the two conditions occurred together more often than would be expected just by chance. About that time, Duke ophthalmologist Scott Cousins, MD, gave a talk to the Duke geriatrics division, and Whitson approached him about studying the link.

LEARNING TO LIVE WITH REDUCED VISION IS EVEN HARDER WHEN YOU ALSO HAVE MEMORY PROBLEMS. EYE CENTER DOCTORS ARE HELPING PATIENTS COPE WITH BOTH.

That was six years ago. Now Whitson, Cousins, and Diane Whitaker, OD, have a study in press in the *Journal of the American Geriatrics Society* that documents in great detail how the usual services offered to patients with low vision may fail to meet the needs of patients with other health problems, including cognitive impairment. The researchers conducted more than 600 interviews with 98 patients with macular degeneration and their companions who accompanied them to low-vision training. In most cases they interviewed each patient and their companion multiple times. The researchers also performed cognitive and vision tests with the patients. "The study categorizes some of the ways that comorbid medical problems impact a patient's ability to benefit from a health service such as a low-vision training program," Whitson says.

Whitson and Whitaker have used what they learned to design a low-vision rehabilitation program especially for patients with cognitive impairment. The program differs from the norm in several ways. For one, it includes more repetition. "Even people with short-term memory problems can master something new, but they need to hear it multiple times, over a short period of time, to reinforce it," Whitson says.

The new program is very focused: the participants try to achieve just two goals during a six-week training period. "We try to hammer in those two lessons, rather than having a big agenda," Whitson says. The participants set their own goals, such as being able to read a bible or fix a lawnmower carburetor.

Eliminating distractions helps too. The Eye Center's usual training room for people with low vision is so full of nifty gadgets that the doctors call it "the toy shop." But it can be overwhelming, so the specially designed training happens in a room with little more than a chair, a desk, and the closed-circuit television device often used for viewing magnified objects.

The last essential element of the training is a companion—a friend or family member who attends one of the six training sessions and helps the patient with homework for one hour each week. The team's study suggested that many patients need someone to act as an advocate at their appointments and to help them remember what they learn at training.

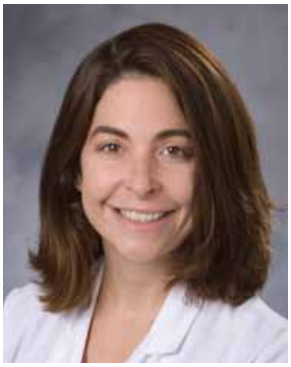
The team has just completed a pilot study of the new program, which revealed something surprising; after the low-vision intervention, many of the patients not only were better at performing vision-dependent study tasks, but also showed an improvement in memory scores. "If you are learning a new skill, that's a cognitive intervention as well," Whitson says.

Whitson and Whitaker have now begun a new project to track success in a small number of patients using a novel tool they developed. The usual way of evaluating progress involves the patient answering questions about how much they've improved at important tasks such as grocery shopping or driving. But such self reports may be unreliable, particularly in subjects with cognitive problems. So Whitson and Whitaker developed a second measure of success by timing the participants as they actually perform tasks, such as writing out a grocery list. That yields a concrete measure of progress, such as what the grocery list looks like before the training and after.

Rethinking tools and measures: A new Duke intervention that focuses on high repetition of just two functional goals is yielding improvement in both vision-dependent tasks and memory scores. Diane Whitaker, OD, and Heather Whitson, MD, are working to explore new ways to measure progress in patients with low vision and cognition problems, as well as the link between the two.

The team is now exploring some of the reasons behind the link between macular degeneration and cognitive impairment. They're recruiting patients with macular degeneration for a study that will use functional MRI to explore how these patients' brain connections differ from people of the same age without macular degeneration. "The Eye Center is embracing a whole-person approach," Whitson says. "As Dr. Cousins says, we must 'think outside the eye' if we're going to continue to provide the best care available, especially for an aging population."

This work was funded by the Hartford Foundation and the National Institutes of Health.


Heather Whitson


Diane Whitaker


Scott Cousins

RESEARCH UPDATES

A glaucoma device for home use

Certain children with severe or uncontrolled glaucoma may benefit from a handheld device used at home to measure pressure inside the eye. A study published in summer 2011 by Duke Eye Center glaucoma specialist Sharon

Freedman, MD, and colleagues in the *American Journal of Ophthalmology* is the first to test the Icare tonometer in children during home use; the study found that parents were able to use the unit at home, and home pressure monitoring sometimes provided important information that was not identified during daytime office visits. Early in the year, Freedman published an initial study (*J AAPOS* March 2011) showing that eye-pressure measurements clinicians made with the Icare tonometer were usually comparable to those taken with the "gold standard" in-office pressure measurements at the slit lamp (called Goldmann applanation tonometry). "After that, I felt confident teaching parents to use the device for home eye pressure measurements,"

Duke's Sharon Freedman, MD, here with twin patients Sara (left) and Sadie Edgecomb, says a new device that can be used at home to measure eye pressure may improve glaucoma control in certain patients.

Freedman says. In the new study, the researchers enrolled 17 children with glaucoma and 11 children without glaucoma; after the pressure was first measured in the office with both the Icare and Goldmann applanation, multiple home measurements were taken by each child's parent over two sequential days. The study found that the home measurements were reliable, and they provided clues as to how to improve treatment for some children. "In some cases we found that children's pressures were substantially higher at certain times when they were at home. That suggested that the glaucoma wasn't controlled and therefore it might be necessary to change or alter the way we were treating those children," says Freedman.

For instance, thanks in large part to the home use of the Icare tonometer, 11-year-old twin girls Sara and Sadie Edgecomb, who see Freedman for treatment of a rare and severe form of glaucoma, were discovered to have eye pressures that often spiked to very high levels early in the morning. That finding enabled Freedman to determine the best treatments for them, including surgical procedures to lower the pressure in their eyes. As a result, they are well on their way to being able to reduce their frequent long treks from their home in Maine to Duke.

The published study suggests that the Icare tonometer may be an ideal tool for home monitoring of eye pressures for a short period of time in certain patients. "The device costs about $4,000, so we certainly wouldn't recommend that every child with glaucoma have a tonometer at home," Freedman says. "But it may be useful in cases where we suspect the glaucoma isn't controlled well, and we can't get to the bottom of it in the clinic, or where there is not a lot of margin for error, because the glaucoma is already so severe."

Uncharted territory in the infant eye

Duke ophthalmologists Sharon Freedman, MD, and Cynthia Toth, MD, have each been caring for and studying children's eyes for more than two decades. But this year, they were reminded that there's still more left to discover about the infant eye.

Toth, who is also trained as a biomedical engineer, has developed special expertise in a relatively new imaging technique—spectral domain optical coherence tomography (SDOCT)—that enables her to non-invasively and quickly image the retina at ultra high resolution. Toth was using the technique to monitor the developing macula and retina in premature babies with an eye condition called retinopathy of prematurity (ROP), which can be blinding. She found that some of the babies had some abnormalities in the central part of the retina that she suspected were caused by the ROP or the prematurity itself. But she needed to know what the developing retina looked like at high resolution in normal babies. So she partnered with Freedman, chief of the Duke Eye Center's Pediatric Ophthalmology and Strabismus Service, to image the eyes of some full-term babies.

They were expecting to use the data simply as a comparison. Instead, the two doctors and their clinical fellows Michelle Cabrera and Ramiro Maldonado found something completely unexpected. About 15 percent of the normal, full-term babies had fluid under the macula, which was not detectable by the ophthalmologist using standard examination methods (called indirect ophthalmoscopy).

This finding from their study of 40 newborn infants, which has been accepted for publication by the *American Journal of Ophthalmology*, intrigues the doctors, but they're not certain what it means. It may be just a normal variation that hadn't been discovered before. "We think that the fluid goes away within a few months. We think it probably doesn't have any effect on vision. But we don't know that for sure. It needs to be studied further," Freedman says. "This is an example of how a new technology found something interesting and unexpected in otherwise perfectly healthy babies that was not previously identified. We look forward to using SDOCT to better understand how the normal baby's macula develops, and hopefully from there to a better understanding of how this process can go wrong in diseases like ROP."

LECTURES ON THE ROAD

Cosmetic complications, ultrasound for bone dissolution, laser eyelid surgery

Julie Woodward, MD, gave the keynote speech at the American Academy of Cosmetic Surgeons 2011 annual meeting, where she spoke about complications of cosmetic procedures, including laser surgery, blepharoplasty, Latisse, and injectable treatments such as Botox and fillers. "Every procedure has some form of complications reported, and I felt it was important for surgeons to be aware of the complications, to recognize them, and to understand how they can take care of them intraoperatively and postoperatively," Woodward says.

At Xijing Hospital in Xi'an, China, Woodward shared her expertise in using ultrasound to dissolve bone during orbital decompression surgery for thyroid eye disease. Using ultrasound instead of a drill protects the tissue around the eyes and brain; the ultrasound waves just move with the tissue instead of destroying it. "It makes dissolving bone much less stressful," Woodward says. She also spoke in China about one of her specialties—using lasers to perform eyelid surgery without incisions. "When you do a procedure with a laser, it takes half the amount of time as with a knife, so I can do it under a straight local anesthesia, instead of having the patient go under general anesthesia," she says. That saves the patient money and recovery time.

Julie Woodward, MD, with Guo Shuzhong, MD, PhD, chair of plastic surgery at Xijing Hospital

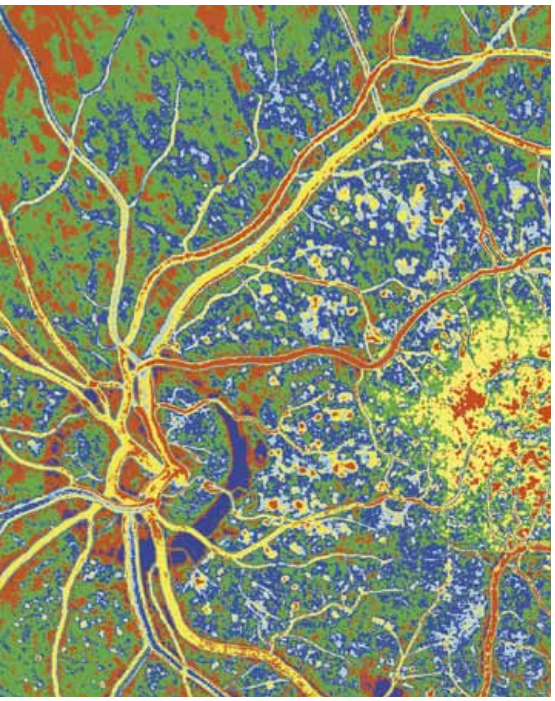
Xeomin and Ulthera: Upcoming clinical trials

Later in 2012, Woodward expects to lead Duke's participation in clinical trials of a new product and a new device. Xeomin is a new injectable cosmetic treatment that is similar to Botox, but some extra proteins that don't have any therapeutic effect have been removed. It is FDA approved in the United States. "So far researchers haven't found any major disadvantages or advantages of Xeomin over Botox other than the fact that you're getting less of these extra proteins to stimulate antibodies," Woodward says.

Woodward will also participate in clinical trials of a new device called Ulthera, which uses ultrasound to lift and firm skin without incisions. "Ulthera is very exciting; it's the only device that is FDA approved for performing non-surgical facelifts," she says.

IMMUNOTHERAPY

A systemic treatment for dry AMD?



Retinal fluorescein angiogram of age-related macular degeneration.

Scientists at the Duke Eye Center have discovered that an immunotherapy shows promise as a potential early treatment for age related macular degeneration (AMD), which is the leading cause of irreversible blindness in the elderly.

The study is the first to suggest a potential treatment for early AMD, for which there are no currently available treatments. This treatment may also work in late-stage AMD, which is categorized as either 'dry' or 'wet'—and currently there are treatments for only the wet form.

"This is a breakthrough, since prior to this all we had before were antioxidant vitamins that may help the early form of the disease progress more slowly. But this study points the way to an actual therapy," says Catherine Bowes Rickman, PhD, associate professor of ophthalmology and cell biology and lead author of the study. The study was published in June in the journal *Proceedings of the National Academy of Sciences*.

In their investigation, the researchers used a mouse model of AMD created by Bowes Rickman's team. When they injected the mice systemically with an antibody that blocks a protein called amyloid beta, they prevented the mice from developing key symptoms of AMD, including vision loss and damage to retinal pigment epithelial cells, which are crucial to maintaining the photoreceptors. "We were able to prevent the mice from getting this disease," Bowes Rickman says. "This study is a proof-of-principle that establishes that this antibody is a viable therapeutic candidate."

Bowes Rickman also believes that the study results offer promise of a systemic

treatment, because they found that injecting the antibody into the bloodstream targeted the underlying pathology that leads to the problem that damages the eye. It's not certain exactly how the antibody prevented the disease, nor exactly what role amyloid beta plays in the vision loss that occurs in AMD. But scientists believe that AMD shares some common pathology with atherosclerosis and Alzheimer's disease. "One of the hallmarks of dry AMD, like atherosclerosis and like Alzheimer's, is that deposits build up that are rich in lipids and proteins. In the case of AMD, those deposits are in the back of the eye," Bowes Rickman says. One of the proteins found in the AMD deposits is amyloid beta, which is also found in the plaques that are characteristic of Alzheimer's disease.

To create the mouse model, Bowes Rickman used some of the characteristics that contribute to increased risk for AMD in humans, including advanced age, a high-fat, high-cholesterol diet,

and genetic manipulation so that the mice express a particular version of a protein called apoliprotein E. Mutations in this protein are also associated with an increased risk of Alzheimer's disease. AMD is characterized by the accumulation of extracellular lipid- and protein-containing deposits between the retinal pigmented epithelium (RPE) and a layer of tissue beneath it known as Bruch's membrane. These sub-RPE deposits contain activated components of the complement system, which boosts host defense against invading pathogens and proteins that modulate the immune response including amyloid beta.

One theory about the cause of dry AMD is that this complement system for removing amyloid beta from the eye is compromised. This theory is supported by the results of this study. When the researchers administered the antibody in higher doses, there was a dose-dependent reduction in the levels of deposits containing amyloid beta and activated complement components in the eye, as well as increases in plasma amyloid beta concentrations. These results suggest that antibody binding to the amyloid beta while it's circulating in the blood keeps the amyloid from collecting in the eye, where it somehow causes damage.

Durham Veterans Affairs Eye Clinic: Growing bigger and better

Waiting areas are less crowded and wait times have improved at the Durham Veterans Affairs Medical Center (VAMC) eye clinic, thanks to expanded clinic facilities that opened in August 2010. Led by Duke's Sharon Fekrat, MD, the VA clinic is staffed by two full-time VA optometrists as well as many of the Duke Eye Center faculty and residents. In 2010, the center had 20,000 visits from veteran patients.

Before the expansion, the eye clinic was very crowded and overflowing at the seams. "Many veterans, including those with walkers or in motorized wheelchairs, were waiting in the narrow hallways," Fekrat says. "Sometimes providers and residents just had to step over the feet of the patients to get through the hallways." No longer. Now there are two separate waiting rooms within the clinic proper in addition to a larger waiting area outside the check-in area. The number of exam lanes have doubled from seven to 15, which allows the providers to use two rooms instead of one to see patients more efficiently. The number of laser rooms increased from one to two to allow more patient care to happen at once. "The Eye Clinic space just absorbs the volume," says Fekrat.

Technology additions have facilitated the patient visit and improved the teaching experience for ophthalmic technician students, medical students, and residents, among many others who rotate through the VA Eye Clinic. Now the slit-lamp biomicroscopes in every exam room have a video camera and monitor, which enables family members and trainees to watch parts of the eye exam in real time. In addition to the medical record, the imaging system at the clinic is now paperless, which means staff can view all ophthalmic images on any workstation. "Now the imaging results of a patient's entire exam can be easily displayed for review with a patient's family member or by trainees, students, technicians, or attendings. It's a very powerful tool," Fekrat says. "And it is a very effective, reliable, and efficient piece of software."

Patients at the VA also get the benefit of forming doctor-patient relationships

with the ophthalmology residents who now operate a continuity clinic, seeing many of the same patients at the VA for all three years of their residency.

The surgical ophthalmology service at the VA is very busy, performing the largest number of surgical procedures (790 in 2010) of any surgical specialty at the VA. The equipment in the operating room is state-of-the-art, including the recent addition of a Zeiss Lumera 700 operating microscope and the Alcon Infiniti machine for cataract surgery. Many cost saving approaches have also been implemented.

The VA Eye Clinic's services are further expanding with two satellite clinics within North Carolina. One is already operating in Morehead City, and a second satellite clinic is planned for Greenville. "We have a terrific team," Fekrat says.

The new clinic is part of an almost 20-year effort by the Duke Eye Center to expand specialty services beyond the main clinic at Duke University Medical Center, reaching out into the surrounding communities to provide easier access for patients. Eye Center faculty members have historically provided services in Winston-Salem; Danville, Virginia; Wilmington; Cary; and several locations around Durham. Most recently (prior to the Page Road opening), the Eye Center expanded its office in Cary and opened a full-service clinic in Raleigh at Duke Medicine Plaza at Duke Raleigh Hospital in 2008.

BUILDING FOR THE FUTURE

Now open: Duke Medical Plaza at Page Road

In August, Duke Eye Center opened a full-service clinic at Duke Medical Plaza at Page Road, the newest addition to the Duke network of satellite offices that is also home to Duke Orthopaedics. Patients in the Research Triangle Park and surrounding areas now can receive care from Duke Eye Center specialists in glaucoma, cornea, retina, and oculoplastics right in their own community, or near their place of work.

"This is an exciting time at the Duke Eye Center and we are thrilled to participate in another Duke multidisciplinary clinical destination," says Duke Eye Center clinical operations officer Michael Howard. "The new Duke Eye Center at Page Road will make our ophthalmology services more accessible than ever for the people we serve."

PAGE ROAD PLAZA:

7 physicians

20 total employees (including physicians)

Specialties:

- Cornea
- Cataract Evaluations
- Glaucoma
- LASIK/Refractive surgery consultations
- Retinal diseases
- Oculoplastics, reconstructive, and cosmetic surgeries

Total square footage: **8,500**

PROVIDERS AT PAGE ROAD

Anna Bordelon, MD
Comprehensive Service

Preeya Gupta, MD
Cornea and Refractive Service

Thomas Hunter, MD
Glaucoma and Comprehensive Services

Terry Kim, MD
Cornea and Refractive Service

Tamer Mahmoud, MD, PhD
Vitreoretinal Diseases and Surgery

Usha Reddy, MD
Oculofacial Surgery Service

Jullia Rosdahl, MD, PhD
Glaucoma Service

Home improvements

Meanwhile, back on the Duke University Medical Center campus, plans are taking shape to create a new, more spacious, patient-friendly cornerstone facility: the Duke Eye Center Pavilion.

"Our current facility, the Wadsworth Building, was built 40 years ago and was designed to accommodate eight clinicians and 20,000 patients a year," Howard explains. "Today, we have over 50 clinicians serving more than 80,000 patients a year. As part of our mission to provide excellent patient care, it has become imperative that we build a new clinical facility on our main campus to accommodate patient growth."

Because space on campus is limited—and because the Eye Center will continue to see patients while the new facility is being built—a new parking deck next door to the current clinic was completed in 2010. Currently, the design of the new Eye Center Pavilion, which will be built in front of the Wadsworth Building, is under way. Completion of the new clinical facility is slated for 2014.

> "This expansion will allow us to expand our focus on our research and teaching programs."
>
> // MICHAEL HOWARD

The master plan for the Eye Center is to have the Albert Eye Research Institute, which was completed six years ago, serve as home to all of the Eye Center's basic science research initiatives and faculty, while the current facilities in Wadsworth Building and the new clinical building will house the Eye Center's growing clinical and clinical research services.

"This is an opportunity to create a state-of-the-art eye care facility for provision of world-class clinical services," says Howard, who notes that the Eye Center is now looking for philanthropic leadership contributors to this project. "At the same time, this expansion will allow us to expand our focus on our research and teaching programs. When this new facility is complete, the Duke Eye Center will have both a program and a physical campus that rivals any ophthalmology program in the nation."

DUKE EYE CENTER PAVILION

Preliminary artist rendering; pending approval of Certificate of Need from the State of North Carolina

MEET OUR NEW FACULTY

Exploring new treatments for glaucoma

Daniel Stamer, PhD, is excited to rejoin the Duke Eye Center after completing his research fellowship in glaucoma here 15 years ago. Most recently he was a professor and associate head for vision research at the University of Arizona. Stamer plans to make bigger strides in his glaucoma research now that he's in an environment with more vision investigators. "For many years, I was flying solo in terms of glaucoma research in Tucson. I am excited to come to Duke to join one of the top glaucoma groups anywhere," he says.

Trained in pharmacology and toxicology, he works to identify novel drugs for treating glaucoma that would complement current treatments that reduce elevated intraocular pressure. "The current drugs lower the amount of fluid that comes in the eye, so the faucet is turned down a bit, or increases the amount of fluid that leaves the eye via a secondary pathway," Stamer says. "The drug targets I'm looking at are involved in the primary drain part of the eye—the part of the eye that is diseased in glaucoma and where almost all of the fluid exits. Unfortunately, we don't have a drug now that targets the drain." Working with his Duke colleagues, Stamer wants to find novel drug targets and collaborate with pharmaceutical companies to develop new medications. "Before I retire, I'm hoping that I can help bring one or two new drugs to market that will be used to help lower pressure in people with glaucoma and preserve their vision," he says.

Searching for the source of glaucoma

Jullia Ann Rosdahl, MD, PhD, is a clinician scientist who will treat patients with glaucoma while also working to identify the causes of the disease. "My

research will focus on trying to identify molecular pathways that are important in the aging of an organism and trying to find out whether they are involved in glaucoma," she says. Rosdahl found Duke to be an ideal fit because of her desire to treat patients as well as conduct research. "I wanted to come to Duke because the glaucoma service here is so strong, and with Dr. Epstein leading the way, there is such strong support here for people like me who want to be clinician scientists," she says. "I have always wanted to do both patient care and research. I really like talking to patients and hearing about their lives." Rosdahl will have two half-day clinic sessions per week, on Wednesday mornings at the new Page Road clinic and on Thursday afternoons at the main Eye Center. Rosdahl's research is funded by a National Institutes of Health Clinical Scientist Development award, in which she is mentored by Pedro Gonzalez, PhD; Pratap Challa, MD; and Stuart McKinnon, MD, PhD.

Planting roots in Duke's cornea practice

After completing her residency at the Duke Eye Center, Preeya Gupta, MD, went to her hometown of Minneapolis, Minnesota to complete a prestigious fellowship in cornea and refractive surgery at Minnesota Eye Consultants. Then she felt drawn back to Duke, this time as a faculty member. "The Eye Center is an excellent place to plant roots—it's an environment that provides not only excellent care to patients but also opportunities to be involved in teaching and research," Gupta says. At the Eye Center's new Page Road clinic, Gupta will focus on cornea and refractive surgery, including corneal transplantation, LASIK, cataract surgery with specialty intraocular lenses, and treating patients with ocular surface problems such as dry eye and blepharitis.

In addition to seeing patients, Gupta plans to pursue research in new treatments for dry eye, which she says is an under-recognized condition. "Dry eye and blepharitis affect up to 80 million people, but a lot of practitioners don't recognize it and haven't necessarily been looking for it," she says. During her fellowship, Gupta worked with a new treatment for dry eye, intense pulse light therapy (IPL).

"There are only a handful of centers across the country offering this treatment, and I'm hoping to bring it to Duke." She is currently also involved with other new cutting edge treatments, such as Lipiflow, to help patients suffering from chronic dry eye disease.

The eye as a window on diabetes

Tamer H. Mahmoud, MD, PhD, has joined the Duke Eye Center as associate professor of vitreoretinal surgery. Mahmoud has strong ties to the Eye Center, having done his ophthalmology residency, a retina research fellowship, and a vitreoretinal surgery fellowship here. For the past six years he has conducted a large body of research on diabetic retinopathy as a faculty member at the Kresge Eye Institute at Wayne State University. At Duke, he will

continue his research and will take over the practice of renowned retina surgeon Brooks McCuen, MD, who retired in March 2011. "I will be performing complex retinal procedures, treating complex retinal detachment and diabetes complications surgically," Mahmoud says. "I will be very busy. But this is what I like to do."

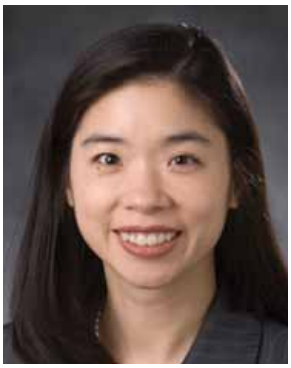
One project that Mahmoud will continue at Duke involves long-term tracking of outcomes of patients on which he performs surgery to correct vision complications of diabetes. In past studies, he has correlated outcomes of eye surgeries with information about each patient's overall condition. "We found that the groups that ended up having a stroke or a heart attack or being on dialysis were the ones whose eyes also did not improve much with the surgical procedure. This was an indication to us that it's not only about the eye," Mahmoud says.

He will continue exploring this approach in collaboration with a Duke team that will include basic scientists and clinicians of different disciplines, under the auspices of a to-be-formed diabetes research center. "It's important for ophthalmologists to work with researchers in different disciplines, to try to figure out what is going on systemically," Mahmoud says.

In his studies, Mahmoud has found that non-invasive imaging, such as optical coherence tomography (OCT), conducted before surgery can help predict patient outcomes. "Even before I perform the surgical procedures, there are a few indices that I look at using OCT. Whether certain changes are present or absent can indicate whether their eyes will do poorly or do well after the surgical procedures. Some of these changes on OCT also correlate with their systemic status. So now we have a way to look at pictures that are easy to get before surgery, and we can include that in discussions of the patient prognosis," he says.

An irresistible opportunity

"The opportunity to be back at the Duke Eye Center was something I couldn't pass up," says Anna Bordelon, MD, who returns as an assistant professor of ophthalmology after completing her ophthalmology residency at the Eye Center in 2009. Bordelon trained in cornea and external eye disease during a fellowship at the Wilmer Eye Institute at Johns Hopkins University, then worked as a faculty member there. She has collaborated with Eye Center faculty member Natalie Afshari, MD, on a research project looking at air bubble-associated endothelial trauma in Descemets stripping endothelial keratoplasty (DSEK), a new form of corneal transplant that involves replacing just the posterior layer of the cornea. Bordelon will continue to pursue research in that area. She's



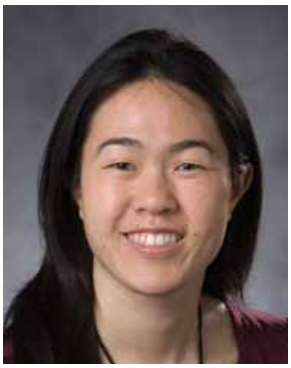
currently conducting a project in collaboration with Wilmer Eye Institute to compare patient experiences with DSEK surgery versus traditional full thickness corneal transplantation. "I'm comparing patient preferences—how they perceive each surgery and which they prefer, the old form of cornea transplant, or the newer one," she says. Bordelon will see patients on the comprehensive service at the new Page Road clinic.

Combining patient care and public health

S. Grace Prakalapakorn, MD, MPH, likes the personal connections she forms with her patients, but she has also seen the big difference that changing public health practices can make. As she joins the Duke Eye Center faculty, she will try to do both, seeing pediatric ophthalmology patients at the Eye Center's Raleigh clinic as well as working on a research project that aims to improve screening for retinopathy of prematurity (ROP) in

developing countries. ROP occurs because of the incomplete development of retinal vascularization in the eyes of premature babies at birth. Subsequently, abnormal blood vessels can develop and cause vision loss in some cases.

The need for better screening for ROP became real for Prakalapakorn when she went on a trip to China with the ORBIS "flying eye hospital," which brings ophthalmologists to developing countries. "It's one thing to hear a statistic that a country has one ophthalmologist for 'x' million people," she says.



"It becomes much more real when you go to these countries and see the limited resources people have, and you ask a doctor, 'do you screen for this?' and the doctor says, 'we should, but we don't have anybody trained to do it.'"

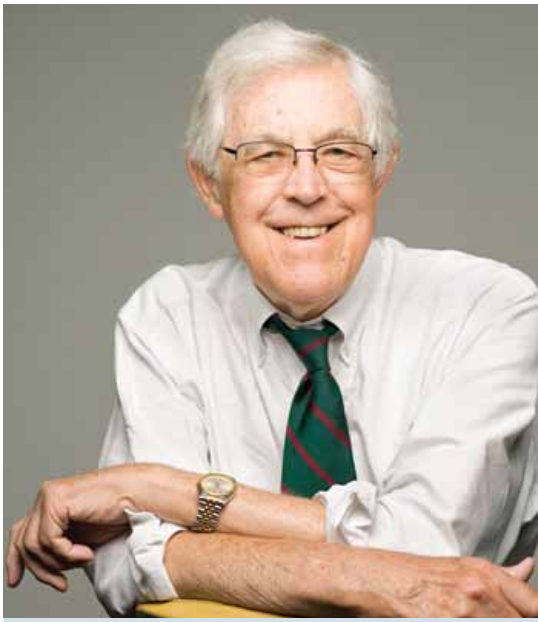
Prakalapakorn will focus her efforts on Asian countries such as Thailand, where her parents are from. ROP can become a problem in countries like Thailand where the health care system is developed enough that premature babies get the care they need to survive, but not enough to ensure that these babies are screened for diseases such as ROP. Prakalapakorn will try to develop and implement a program that addresses the shortage of trained ophthalmologists by training nurses, nurses aids, or other health care workers to conduct screenings. Her research is funded by a National Institutes of Health Clinical Scientist Development award, in which she is mentored by David Wallace, MD, and Sharon Freedman, MD.

Giving back to education

Derek W. DelMonte, MD, who completed his residency at the Duke Eye Center in 2010, returns now as a faculty member. He will focus on clinical work as well as contributing to medical student and resident education. "I really enjoyed my time at Duke, and I thought it would

be a lot of fun to be on the other side and to try to give back to education and to the residency program," he says. DelMonte has begun trying to develop a formal surgical curriculum for residents. "We have great surgical education here, but it will be even better to prepare residents for surgery with a formal curriculum," he says.

DelMonte's clinical interests lie in the cornea. After his residency at Duke he completed a fellowship at the Bascom Palmer Eye Institute in Miami, where he focused on advanced corneal ophthalmology, including new ways to treat infectious keratitis (inflammation of the cornea).



Klintworth donates book collection

Eye Center research professor Gordon Klintworth, MD, PhD, has donated about 185 books to the history of medicine collections at Duke's medical center library and archive. The books are reproductions of classic series on the history of medicine and ophthalmology, some of them limited editions. The donation provides wide access to beautifully bound reproductions of books whose original editions are rare. "These are the kinds of materials that rare book collections treat with special care, so a lot of people don't get to see them or touch them. Dr. Klintworth's collection allows people to use and borrow beautiful reproductions of important original works," says Pat Thibodeau, associate dean for library services. "They are a great resource for students and scholars interested in the history of medicine."

Klintworth plans to donate more books in the future. "I've been collecting the books for more than a decade, and I thought they should go to a library that would make the collection available to readers," he says.

The medical center library held a reception in honor of Klintworth and the donation on April 12, 2011.

CORNEAL/EXTERNAL DISEASE

Noel Rosado-Adames, MD
Medical School: University of Puerto Rico School of Medicine
Internship: San Juan City Hospital (Transitional Program)
Residency: University of Puerto Rico School of Medicine
Chief Residency: University of Puerto Rico School of Medicine

Capt. Matthew Kuhnle, DO
Medical School: Kirksville College of Osteopathic Medicine
Internship: Transitional Internship, Walter Reed Army Medical Center
Residency: Walter Reed Army Medical Center
Army Staff Ophthalmologist, Assistant Chief of Refractive Surgery, Carl R. Darnall Army Medical Center

Thomas Litzinger, MD
Medical School: The Ohio State University
Internship: Riverside Methodist Hospital, Columbus, OH
Residency: California Pacific Medical Center, San Francisco, CA
Chief Residency: California Pacific Medical Center, San Francisco, CA

GLAUCOMA DISEASE

Annie Lim, MD
Medical School: University of California, San Fransisco
Internship: Harbor UCLA Medical Center (Transitional Medicine)
Residency: University of California Los Angeles

James Kim, MD, PhD
Medical School: University of Michigan
Internship: Summa Health System, Akron, OH
Residency: Cleveland Clinic, Cole Eye Institute

Amy Fang, MD
Medical School: Washington University, St. Louis, MO
Internship: Indiana University Methodist Hospital
Residency: Washington University, St. Louis, MO

OCULOPLASTIC & RECONSTRUCTIVE SURGERY

Michael Ehrlich, MD
Medical School: Jefferson Medical College
Internship: Albert Einstein Medical Center
Residency: Wills Eye Institute

Sulene Chi, MD, PhD
Medical School: Duke University School of Medicine
Graduate School: Duke University
Internship: Duke University Department of Internal Medicine
Residency: Duke Eye Center

PEDIATRIC OPHTHALMOLOGY

Brenda Bohnsack, MD, PhD
Medical School: Baylor College of Medicine
Internship: Oakwood Hospital, Dearborn, Michigan
Residency: University of Michigan
Chief Residency: University of Michigan

Fatema Ghasia, MD
Medical School: Baroda Medical College ,M S University, India
Post Doctoral Fellowship: Ocular Motility, Washington University St Louis
Post Doctoral Fellowship: Pediatric Ophthalmology, Washington University, St. Louis
Internship: St Mary's Health Center, St. Louis
Residency: Washington University, St. Louis

Jennifer Dao, MD
Medical School: Georgetown University School of Medicine
Internship: Sinai-Grace Hospital at Detroit Medical Center
Residency: Georgetown University / Washington Hospital Center
Chief Residency: Georgetown University / Washington Hospital Center

MEDICAL RETINA

Larry Koreen, MD, PhD, MPH
Medical School: University of Medicine and Dentistry of New Jersey/New Jersey Medical School
Internship: St. Barnabas Medical Center
Residency: W.K. Kellogg Eye Center, University of Michigan

Eleonora Lad, MD, PhD
Medical School: Rosalind Franklin University of Medical and Science, North Chicago, IL- MD, PhD (Neuroscience)
Internship: Kaiser Santa Clara, CA
Residency: Stanford University

Prithu Mettu, MD
Medical School: Duke University School of Medicine
Internship: Internal Medicine, Duke University Medical Center
Residency: Duke Eye Center
Chief Residency: Duke Eye Center

Neha Serrano, MD
Medical School: Georgetown University School of Medicine
Internship: University of Chicago Medical Center - Internal Medicine
Residency: Georgetown University Hospital/ Washington National Eye Center

VITREORETINAL DISEASES & SURGERY

Phoebe Lin, MD, PhD
Medical School: University of Illinois at Chicago, College of Medicine
Internship: MacNeal Hospital
Residency: University of California, San Francisco

Paul Hahn, MD, PhD
Medical School: University of Pennsylvania School of Medicine
Internship: Presbyterian Medical Center, University of Pennsylvania
Residency: Scheie Eye Institute, University of Pennsylvania

Joseph Martel, MD
Medical School: University of Nevada
Internship: Brigham and Women's Hospital
Residency: University of California, San Francisco

Lejla Vajzovic, MD
Medical School: Mayo Clinic College of Medicine
Internship: St. Louis University Hospital
Residency: Bascom Palmer Eye Institute

MAKING A GREAT RESIDENCY BETTER

Trainees learn continuity of care and real-world responsibility

SEVERAL NEW FEATURES OF THE RESIDENCY PROGRAM are increasing its reach and making the experience even more valuable. To respond to the growing demand for eye care, in 2011 the residency began accepting six residents per year instead of five. "The increase is a response to the high clinical volume at the Eye Center, as well as a national push for more ophthalmologists because of our country's aging population," says Pratap Challa, MD, residency program director and associate professor of ophthalmology.

Another new feature equips residents earlier to provide the best care; it's a mixed rotation that gives residents brief experience in all the different subspecialties very early in their first year. "One of the big issues we found was that when the residents took care of pediatric patients on call, for instance, they may not have done their pediatric rotation yet. This gives them experience on all the different services in their first year," Challa says.

Another change is a continuity clinic at the Durham Veterans Affairs Medical Center (VAMC) that enables each resident to care for a few patients there for all three years of their residency. "This change gives the residents a better opportunity to see patients long term," Challa says. Michael Allingham, MD, a second-year resident, likes the chance to form more of a connection with patients. "One of the challenges of residency is that everybody is temporary. You are only in one place for a couple of months. The continuity clinic at the Durham VA is a unique chance to have at least a few patients who are yours for the whole three years. Part of being a doctor is being someone's caregiver. Experience in doing that is something that is frequently missing from residencies everywhere," Allingham says.

First-year resident Zachary Zavodni, MD, examines a patient with attending Sharon Fekrat, MD, at the Durham VA Medical Center.

Residents also prize the hands-on experience they receive during a rotation at the Asheville VAMC. The Asheville VAMC offers residents autonomy in a busy clinic, but with a slightly different patient population than the Durham VAMC. "The Asheville VA is more like a general outpatient clinic with patients who are reflective of the general comprehensive population," says third-year resident Brian Alder, MD. "And

"This change gives the residents a better opportunity to see patients long-term."

// PRATAP CHALLA

the attending physicians at the Asheville VA are just fantastic. The environment is very positive, and everyone works together as a team. It's a really well-run clinic."

In addition, as part of the rotation, residents get the chance to observe ophthalmologists in private practice at Asheville Eye Associates. "We get a nice exposure to how things run in a real-world private practice setting," Alder says. Ed Isbey Jr., MD, who founded Asheville Eye Associates, also helped start the Asheville VA rotation [see "A Lasting Partnership"].

During each of the clinical rotations, when working together as a team, residents benefit from the expertise of other residents and from senior staff. Such teamwork emerges when residents serve as the first line of treatment for emergencies, says Nieraj Jain, MD, chief resident. "A junior resident will work on call with a senior resident, and then a fellow who has graduated from residency provides a third line of expertise. A lot of learning happens that way," Jain says.

A LASTING PARTNERSHIP: THE ASHEVILLE VA ROTATION

Ed Isbey Jr., MD, has been a friend of Duke Eye Center since the 1970s, giving lectures to residents and serving on the residency selection committee. In 1976 he became an instrumental part of resident education when he helped start a regular rotation for residents at the Veterans Affairs Medical Center (VAMC) in Asheville, located in the mountains of North Carolina. At the time, Isbey and other partners from his private practice, Asheville Eye Associates, would see patients a few days a week at the Asheville VAMC, and he saw that they needed more staff. "The eye service at the Asheville VA was only provided rudimentarily at that time," he says. For the Duke residents it provided a chance to have autonomy in treating patients while getting training from subspecialists such as Isbey. Today the Asheville VAMC has two full-time staff ophthalmologists who supervise the Duke residents, who still play a major role during their time there, seeing patients and performing surgeries.

Isbey's son, Ed Isbey III, MD, who graduated from the Duke Eye Center residency in 1985, says the Asheville VAMC rotation was an experience like no other. "It was invaluable to be in a situation as a third-year resident where you were responsible for everything that went on in the clinic. You had backup to call for advice, but it was a great training experience to take care of patients on your own."

When his father retired in 2011, Isbey III began running Asheville Eye Associates. He has worked with the residents on the Asheville VA rotation both while consulting at the VA and when the residents visit Asheville Eye Associates to observe surgeries and other workings of the private practice. "The residents were very qualified and were able to learn from each other. Sometimes I would learn from them things that Duke was doing, and many times they would learn from things that I was doing," he says.

MEET OUR FIRST YEAR RESIDENTS

These six first-year residents at Duke Eye Center are each pursuing their own path toward a career in ophthalmology

When Paula Pecen, MD, was 10 years old, her mother developed steroid-induced cataracts. Pecen will never forget how one day her mother couldn't see to drive her and her brother to school, then the next day, she could, thanks to an ophthalmologist who removed the cataracts. "That was a really great experience, witnessing how a doctor could help someone regain her vision,"

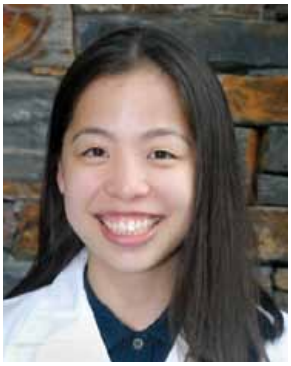
she says. It cemented Pecen's future. Now a first-year ophthalmology resident at the Duke Eye Center, Pecen says that during medical school at Duke, she tried to keep an open mind about her future career, but she always seemed to return to ophthalmology.

"I really liked the balance of research and teaching and the environment that Duke offered," says Pecen, who conducted glaucoma and retina research while in medical school at Duke. She plans to become an academic ophthalmologist who focuses on both research and patient care, though she's not sure in which specialty. "I'm just learning about the tip of the iceberg in ophthalmology," she says.

From the start of medical school, Laura Vickers, MD, knew she wanted to focus on a field that involved surgery, but she also wanted more patient contact than

many hospital-based surgical specialties allow. After a rotation in ophthalmology, she knew she had found the right field. "In ophthalmology it's possible to take a few minutes to spend some time with each patient, which I really enjoy," she says. Vickers has been on ophthalmological surgical mission trips to Rwanda and Mongolia, and she has a wide range of clinical interests, including retina, plastics, and cornea. She is also interested in research, having served a one-year research fellowship in which she tackled problems related to using gene therapy to turn stem cells into photoreceptors. "Right now I have so many interests that it's hard to pursue any one path," she says. "As I go through residency, I'll see what I'm best at and what interests me the most."

Christine Shieh, MD, was drawn to ophthalmology while a medical student at Duke, and it all started with her volunteering at some community vision screenings she helped organize at a mall. The long lines of people, young and old, showed her the need for ophthalmologists, and the patients' questions got her interested in learning more. A second-year elective rotation and third-year continuity clinic in ophthalmology cemented her decision. "I liked the way that ophthalmology encompasses many fields of medicine and basic science. And, when assisting a faculty member on a cataract case, I realized that I enjoyed working with my hands, and



I began to look forward to becoming proficient at delicate microsurgical techniques," she says. In her third year of medical school, Shieh conducted research under the mentorship of Glenn Jaffe, MD, receiving a Research to Prevent Blindness fellowship to study the role of specific proteins in age-related macular degeneration.

Pradeep Mettu, MD, decided ophthalmology might be for him in his first year of medical school at the University of Kentucky College of Medicine, after he volunteered with a group conducting vision screenings. "I was just looking for something to do in my free time, but

then I found I really enjoyed what I was doing," he says. "I kept an open mind as I went through medical school, but the surgical aspect of ophthalmology, combined with the clinical aspect and the longitudinal care of patients all drew me

in," he says. During a fellowship at the National Eye Institute, Mettu conducted basic research as well as clinical research on macular degeneration and Von Hippel-Lindau disease. Mettu went to Duke for his undergraduate degree, and his brother, Prithu Mettu, MD, graduated from the Duke Eye Center residency and is now a medical retina fellow. "Duke was always on my radar as a great place to train," Mettu says. He is excited about learning about the range of ophthalmologic specialties as he enters his first year of residency.

During her third year of medical school at Vanderbilt University, Kim Jiramongkolchai, MD, realized that she liked surgery and the technical aspects of ophthalmology. "The technically challenging surgical cases, the focus on restoring vision, the patient population, and the ocular pathology that were part of complex systemic medical diseases all drew me to choose advanced training in ophthalmology," she says. She chose

Duke because of the Eye Center faculty's reputations as leaders and pioneers. "I knew I would get excellent training as a clinician and a scientist," she says. "I wanted a program that would provide comprehensive clinical and surgical training in ophthalmology and also allow me to develop my research interests and work with innovative clinicians and investigators," she says.

Brian Goldhagen, MD, had his first experience at the Duke Eye Center while attending medical school at Duke, which cemented his decision to come to the

Eye Center for his residency training. He spent a year conducting research in the lab of P. Vasanth Rao, PhD to better understand the role of a particular protein in glaucoma. He liked that so much that he then spent a year conducting cornea research with Natalie Afshari, MD. "The faculty I worked with were extremely knowledgeable and provided me with encouragement and support during all the phases of my research," he says. During his medical school ophthalmology rotation, he was equally impressed by the faculty's devotion to clinical care and to medical students. "I found everyone to be so warm and passionate about teaching and patient care," he says.

CURRENT RESIDENTS

Nieraj Jain, MD - Chief

First Year
Brian Goldhagen, MD
Kim Jiramongkolchai, MD
Pradeep S. Mettu, MD
Paula Pecen, MD
Christine Shieh, MD
Laura Vickers, MD

Second Year
Michael Allingham, MD
Jacqueline Dzau, MD
Mark Hansen, MD
Peter Nicholas, MD
Sujit Itty, MD
Zachary J. Zavodni, MD

Third Year
Brian Alder, MD
Wei Huang, MD, PhD
Janice Clara Liao, MD
Andrew Munro, MD
Kathryn Pepple, MD, PhD

OUTGOING RESIDENTS

Nicholas Ramey, MD, is completing fellowship training in ophthalmic, plastic, and reconstructive surgery at the University of Wisconsin in Madison.

Jessica Chow, MD, is completing a cornea and external disease fellowship at Bascom Palmer Eye Institute at the University of Miami School of Medicine.

Sulene L. Chi, MD, is spending the next two years at Duke as the Oculoplastics and Orbital fellow. She is grateful and excited to continue her time at Duke working with and learning from the Oculoplastics faculty.

Mark Fernandez, MD, is completing a one year fellowship in corneal and refractive surgery at the Wilmer Eye Institute at Johns Hopkins University.

Lan Chang, MD, is a Pediatric Ophthalmology Fellow at the Children's Hospital Boston. She hopes to find an academic position after completing that fellowship in June 2012.

Grants from RPB

Duke Eye Center faculty members were awarded $160,000 in grants to support research in the causes, treatment, and prevention of blinding eye diseases. David Epstein, MD, chair of the Department of Ophthalmology, was granted $100,000 to be used by the department to catalyze new research projects aimed at finding cures for potentially blinding eye diseases through constant innovation.

Cynthia Toth, MD, was granted a $60,000 RPB Physician-Scientist Award to allow her to devote more time to clinical eye research activities, providing greater opportunities for specialized study with direct application to the human condition. Toth is one of 46 physician-scientists at 24 institutions who have received this award since 2000.

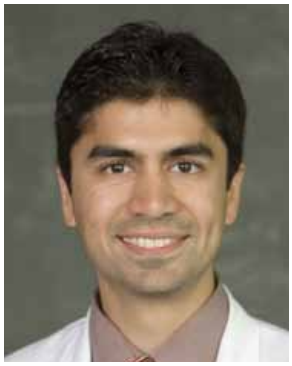
The Duke University School of Medicine was granted a $30,000 RPB Medical Student Eye Research Fellowship to enable Wenlan Zhang to take a year off from medical school and devote time to the pursuit of a research project with the Department of Ophthalmology. She is spending this additional year of research with Catherine Bowes Rickman, PhD, studying genetic polymorphisms in age-related macular degeneration.

Farsiu wins SPS Best Paper Award

Sina Farsiu, PhD, has won the 2010 IEEE Signal Processing Society Best Paper Award in the field of image processing for a paper he wrote on IEEE transactions of image processing. This award selects the best papers from a five-year window: for example, for the 2010 Award, the paper must have appeared in one of the Society's Transactions between January 1, 2005 and December 31, 2009.

Cynthia Toth, MD

Sina Farsiu, PhD



Mark Fernandez, MD

Woodward in PSP

Julie Woodward, MD, oculoplastics service chief, was featured in *Plastic Surgery Practice* on the joys of being a

university surgeon. She was featured on the cover, making her the first female oculofacial surgeon to ever be featured on the cover.

Fernandez selected for Machemer Research Award

Mark Fernandez, MD, was selected for the prestigious Robert A. Machemer Research Award for his project "Corneal limbal stem cell and mucosal epithelial cell transplantation: an interprocedural comparison of graft survival, visual rehabilitation, and financial affordability." His work was presented in June at the 2011 Residents and Fellows Day.

The Robert A. Machemer Research Award, established in 2000, recognizes a resident, clinical fellow, or research fellow whose clinical or basic science research proposal demonstrates high intellectual curiosity, outstanding scientific originality, and has a significant impact on the clinical management of persons with ophthalmic disease. The award honors Robert A. Machemer, MD, a past chair of the Duke Department of Ophthalmology.

Lee named chair of Kellogg Eye Center

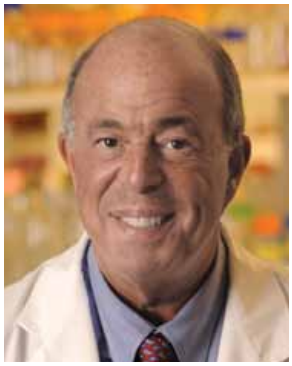
Paul P. Lee, MD, JD, was named chair of the University of Michigan Medical School's Department of Ophthalmology & Visual Sciences, effective February 1, 2012, pending approval by the U-M Board of Regents. Lee is currently vice chairman of the Department of Ophthalmology and the James Pitzer Gills III, MD and Joy Gills Professor of Ophthalmology at Duke.

David Epstein, MD, chair of the Duke Department of Ophthalmology, says, "While I'm personally very sorry that Paul will be leaving us, I fully recognize that the position at the University of Michigan is a terrific opportunity and offers Paul a chance to return to the school at which he earned his undergraduate and

Journal Club meets

Eye Center learners (left) gather at the home of ophthalmology chair David Epstein, MD, for dinner and discussion about the latest in glaucoma research.


Paul P. Lee, MD, JD


David Epstein, MD


Char DeCroos, MD

medical degrees. I have appreciated the many contributions that Paul has made to our department over the years and I know that Chancellor Dzau has greatly valued Paul's counsel recently in his role as senior advisor to the chancellor."

Heed Award winners

Former Duke Eye Center resident Char DeCroos, MD, and current fellows Brenda Bohnsack, MD, PhD, Eleonora Lad, MD, PhD, Prithu Mettu, MD, and Lejla Vajzovic, MD, have been awarded the prestigious Heed Ophthalmic Foundation Fellowship. The Society of Heed Fellows is a public charitable and educational foundation that provides funding for post graduate studies in ophthalmology and the ophthalmic sciences. Beginning with the appointment of the first fellow in 1989, the society has provided more than $430,000 in support of its mission. The society receives financial support through the dues and gifts of former Heed Fellows and friends.

The main mission of the society is the funding of its post-graduate fellowship training award. The annual dues and contributions of former Heed fellows and friends have provided the financial support for this program. Following the initial appointment in 1989, approximately 40 fellowships have been awarded with total funding of $430,000.

Young awarded Raine Visiting Professorship Grant

Terri Young, MD, professor of ophthalmology, was recently awarded a Raine Visiting Professorship grant from the Raine Medical Research Foundation to visit the Centre for Ophthalmology and Visual Science/Lions Eye Institute at the University of Western Australia for 3 weeks in 2012. She received the grant as an invitation by David Mackey, the university's chair of ophthalmology.

Gandhi joins AO

In September 2010, Parag Gandhi, MD, oculoplastics surgeon at the Duke Eye Center of Winston-Salem, was elected by a peer-review process to the AO Faculty, a membership of surgical subspecialists that lecture nationally and teach hands-on courses in craniomaxillofacial trauma and repair. He is one of a small group of oculoplastic surgeons who participate in the AO-ASIF (Association for the Study of Internal Fixation).

Kelly recognized by Ophthalmic Photographers

Michael Kelly, director of Duke Eye Imaging Labs, was elected a fellow of the Ophthalmic Photographers' Society in October at the annual meeting in Orlando, Florida. Fellows are chosen by the Fellowship Committee for their dedication and service to the Society and for their contributions to the field of ophthalmic photography. Fellowship is one of the most prestigious awards bestowed by the Ophthalmic Photographers' Society, and Kelly is one of the youngest members ever to have received this honor.

Honors from the AAO meeting

At the American Academy of Ophthalmology (AAO) meeting this year, Natalie Afshari, MD, was among 20 ophthalmologists selected to participate in the Leadership Development Program Class of 2012. Participants, selected for their demonstrated potential to become leaders in ophthalmology societies, attend four education sessions that address a variety of leadership, advocacy, and association governance topics. Afshari was also elected into the Board of Directors of the Cornea Society.

Also at this year's AAO meeting, Afshari and Leon Herndon, MD, were co-directors of the glaucoma subspecialty day, as well as the cornea subspecialty day.

In addition, second year vitreoretinal fellows Paul Hahn, MD, and Phoebe Lin, MD, took home two of four Ronald G. Michels Fellowship Foundation Awards, which are granted annually to one or more outstanding second-year vitreoretinal fellows currently training in the United States. This was the first year that two fellows from the same program were selected.


Terri Young, MD


Parag Gandhi, MD


Michael Kelly

FACULTY LEADERSHIP

David L. Epstein, MD, MMM	Chairman
Paul P. Lee, MD, JD	Vice Chairman
Scott W. Cousins, MD	Vice Chairman of Research Director, Translational Research Program Director, Center for Macular Diseases
Leon W. Herndon, MD	Medical Director
Eric A. Postel, MD	Director, Perioperative Services
Vadim Arshavsky, PhD	Scientific Director of Research
Catherine Bowes Rickman, PhD	Director, Third-Year Medical Student Program
S. Jill Bryant, OD, FAAO	Director, Contact Lens
Edward G. Buckley, MD	Director, Appointments, Promotion, and Tenure Vice Dean of Medical Education, Duke University School of Medicine
Alan N. Carlson, MD	Faculty Liaison Director, Development
Pratap Challa, MD	Director, Residency Program
Sharon Fekrat, MD, FACS	Chief, Division of Ophth. at the Durham VA Medical Center
Paulo Ferreira, PhD	Assistant Director, Translational Research Program
Sharon F. Freedman, MD	Director, Pediatric Low Vision Program
Sanjay Asrani, MD	Director of Education
Glenn J. Jaffe, MD	Director, Duke Reading Center
Terry Kim, MD	Director, Fellowship Program
Prithvi Mruthyunjaya, MD	Director, Continuing Medical Education
William Rafferty, OD	Director, Optometry Education
Tina Singh, MD	Director, Second- and Fourth-year Medical Student Program
Cynthia A. Toth, MD	Liaison, Duke BioEngineering
Robin R. Vann, MD	Faculty Liaison Director, Information Technology
David K. Wallace, MD, MPH	Director, Site-Based Research (SBR) Program
Julie A. Woodward, MD	Director, Public Education Program Faculty Liaison Director, Ophthalmic Technician Program
Terri L. Young, MD	Director, Pediatric Genetics Program Faculty Liaison, Singapore

ADMINISTRATION

Michael Howard, MBA, FAHEC	Director of Operations
Christopher Frederick, CPA	Finance Director
Evelyn Kelly, OCA	Health Center Administrator
Justin Hammond, BA, BS	Marketing Manager
Nick Hernandez, BS	Senior IT Manager
Erin McKenzie, MBA	Director, Development
Renee Dawson	Coordinator, Continuing Medical Education Director, Education Program Staff
Laura Jensen, MBA	Research Finance Manager

COMPREHENSIVE OPHTHALMOLOGY

Anna Bordelon, MD	Assistant Professor of Ophthalmology
S. Jill Bryant, OD, FAAO	Assistant Professor of Ophthalmology
Anupama Horne, MD	Assistant Professor of Ophthalmology
Thomas Hunter, MD	Assistant Professor of Ophthalmology
Philip H. McKinley, MD, MPH	Assistant Professor of Ophthalmology
John T. Petrowski, III, OD, FAAO	Assistant Professor of Ophthalmology
Laurie K. Pollock, MD	Assistant Professor of Ophthalmology
Frankie-Lynn Silver, MD	Assistant Professor of Ophthalmology
Tina Singh, MD	Assistant Professor of Ophthalmology
Robin R. Vann, MD	Assistant Professor of Ophthalmology Service Chief

CORNEA AND REFRACTIVE SURGERY

Natalie Afshari, MD	Associate Professor of Ophthalmology
Christopher S. Boehlke, MD	Assistant Professor of Ophthalmology
Alan N. Carlson, MD	Professor of Ophthalmology Service Chief
Derek DelMonte, MD	Assistant Professor of Ophthalmology
Preeya Gupta, MD	Assistant Professor of Ophthalmology
Terry Kim, MD	Professor of Ophthalmology
Anthony Kuo, MD	Assistant Professor of Ophthalmology
William Rafferty, OD	Assistant Professor of Ophthalmology
Terry Semchyshyn, MD	Assistant Professor of Ophthalmology

GLAUCOMA

R. Rand Allingham, MD	Richard and Kit Barkhouser Professor of Ophthalmology Service Chief
Sanjay Asrani, MD	Associate Professor of Ophthalmology
Pratap Challa, MD	Associate Professor of Ophthalmology
David L. Epstein, MD, MMM	Joseph A.C. Wadsworth Clinical Professor of Ophthalmology
Sharon F. Freedman, MD	Professor of Ophthalmology Professor in Pediatrics ++
Leon W. Herndon, MD	Associate Professor of Ophthalmology
Jill B. Koury, MD	Assistant Professor of Ophthalmology
Paul P. Lee, MD, JD	James Pitzer Gills, III, MD & Joy Gills Professor of Ophthalmology
Stuart J. McKinnon, MD, PhD	Associate Professor of Ophthalmology Associate Professor in Neurobiology ++
Frank J. Moya, MD	Assistant Professor of Ophthalmology
Kelly W. Muir, MD	Assistant Professor of Ophthalmology
Jullia A. Rosdahl, MD, PhD	Assistant Professor of Ophthalmology
Henry Tseng, MD, PhD	Assistant Professor of Ophthalmology
Molly M. Walsh, MD, MPH	Assistant Professor of Ophthalmology
Carol Ziel, MD	Assistant Professor of Ophthalmology

LOW-VISION REHABILITATION SERVICE

Diane Whitaker, OD	Assistant Professor of Ophthalmology Service Chief

NEURO-OPHTHALMOLOGY

M. Tariq Bhatti, MD	Associate Professor of Ophthalmology Associate Professor of Medicine ++ Service Chief
Edward G. Buckley, MD	Banks Anderson, Sr. Professor of Ophthalmology Professor in Pediatrics ++
Mays El-Dairi, MD	Assistant Professor of Ophthalmology

OCULOFACIAL SURGERY

Parag D. Gandhi, MD	Assistant Professor of Ophthalmology
Jason Liss, MD	Assistant Professor of Ophthalmology
Michael J. Richard, MD	Assistant Professor of Ophthalmology
Julie A. Woodward, MD	Assistant Professor of Ophthalmology Assistant Professor in Dermatology ++ Service Chief

PEDIATRIC OPHTHALMOLOGY AND STRABISMUS

Edward G. Buckley, MD	Banks Anderson, Sr. Professor of Ophthalmology Professor in Pediatrics ++
Mays El-Dairi, MD	Assistant Professor of Ophthalmology
Laura B. Enyedi, MD	Assistant Professor of Ophthalmology Assistant Professor in Pediatrics ++
Sharon F. Freedman, MD	Professor of Ophthalmology Professor in Pediatrics ++ Service Chief
S. Grace Prakalapakorn, MD	Assistant Professor of Ophthalmology
David K. Wallace, MD, MPH	Professor of Ophthalmology Professor in Pediatrics ++
Terri L. Young, MD	Professor of Ophthalmology Professor in Pediatrics ++ Professor of Medicine ++

VITREORETINAL DISEASES AND SURGERY

Scott W. Cousins, MD	Robert Machemer, MD, Professor of Ophthalmology Professor in Immunology ++
Sharon Fekrat, MD, FACS	Associate Professor of Ophthalmology
Glenn J. Jaffe, MD	Professor of Ophthalmology Service Chief
Tamer Mahmoud, MD, PhD	Associate Professor of Ophthalmology
Prithvi Mruthyunjaya, MD	Assistant Professor of Ophthalmology
Eric A. Postel, MD	Associate Professor of Ophthalmology
Stefanie G. Schuman, MD	Assistant Professor of Ophthalmology
Cynthia A. Toth, MD	Professor of Ophthalmology Professor in Biomedical Engineering ++

RESEARCH OPHTHALMOLOGY

Vadim Arshavsky, PhD	Professor in Ophthalmology Professor in Pharmacology & Cancer Biology ++ Scientific Director
Catherine Bowes Rickman, PhD	Associate Professor of Ophthalmology Associate Professor in Cell Biology ++
Sina Farsiu, PhD	Assistant Professor of Ophthalmology Assistant Professor of Biomedical Engineering ++
Paulo Ferreira, PhD	Associate Professor of Ophthalmology Associate Professor in Pathology ++
Pedro Gonzalez, PhD	Associate Professor of Ophthalmology Associate Professor in Pathology ++
Gordon K. Klintworth, MD, PhD	Professor of Pathology, Joseph AC Wadsworth Research Professor of Ophthalmology ++
Paloma Liton, PhD	Assistant Professor of Ophthalmology Assistant Professor in Pathology ++
Goldis Malek, PhD	Assistant Professor of Ophthalmology Assistant Professor in Pathology ++
P. Vasantha Rao, PhD	Associate Professor in Ophthalmology Associate Professor in Pharmacology & Cancer Biology ++
Tatiana I. Rebrik, PhD	Assistant Professor of Ophthalmology
Nikolai Skiba, PhD	Assistant Professor in Ophthalmology
W. Dan Stamer, PhD	Professor of Ophthalmology
Sandra Stinnett, DrPH	Assistant Professor of Biostatistics & Bioinformatics Assistant Professor in Ophthalmology ++
Fulton Wong, PhD	Professor of Ophthalmology Professor in Neurobiology ++ Assistant Professor in Pathology +++

CLINICAL ASSOCIATE

Usha Reddy, MD	Clinical Associate, Oculofacial Surgery

Secondary appointment ++
Tertiary appoinment +++

IT TAKES TEAMWORK

Climbing a mountain and exploring complicated diseases like glaucoma have many things in common. Both challenges require focus, dedication, creativity, and above all else teamwork. On July 16, 2011 at 9:00 a.m., two of the Duke Eye Center's faculty culminated months of preparation in northwestern Wyoming when they reached the summit of the Grand Teton, the highest peak in Grand Teton National Park. Collaborators and friends for 20 years, Rand Allingham, MD, and Dan Stamer, PhD, trained for eight months to prepare for the climb.

In their professional careers they share a passion to decipher the cause of glaucoma, the leading cause of irreversible blindness in the world. Until recently, their collaboration took place between Duke and the University of Arizona in Tucson. This changed in September when Stamer moved his laboratory to the Albert Eye Research Institute at the Duke Eye Center, where he joins Allingham, director of the Glaucoma Service, and one of the nation's foremost glaucoma research teams.

RETINOBLASTOMA FAMILY DAY 2011

Retinoblastoma affects approximately 300 children in the United States each year, making it the most common intraocular cancer of childhood. It usually develops before 5 years of age, and can affect either one or both eyes. The hereditary form of retinoblastoma poses an increased risk for an affected child to develop a tumor in the other eye and cancer elsewhere in the body. Approximately 10 to 15 percent of children with retinoblastoma of one eye and no family history of the condition have the hereditary form.

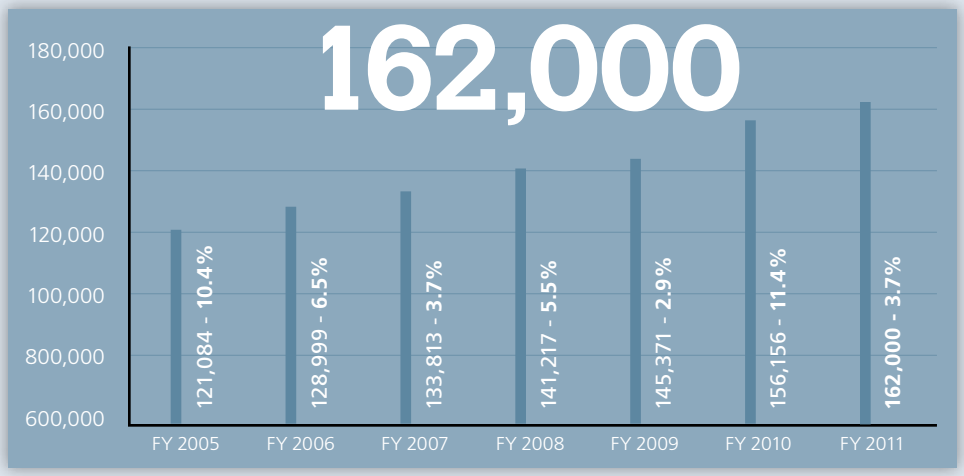
In 90 to 95 percent of cases, retinoblastoma is curable with early detection and treatment. Treatment options depend on the age of the child, as well as specific characteristics of the retinoblastoma tumor within the eye. The currently available treatment options for retinoblastoma include chemotherapy, cryotherapy, radiation therapy, laser treatment, and enucleation.

Duke Eye Center, in conjunction with Duke Pediatric Hematology/Oncology, hosted the second annual Retinoblastoma Family Day on April 30th in the Duke Children's Hospital. This year's event featured a series of informative presentations about updates in treatment, research, and genetics by some of the specialists at Duke involved in the day-to-day care for patients with retinoblastoma. The presenting specialists also talked with families about their individual questions.

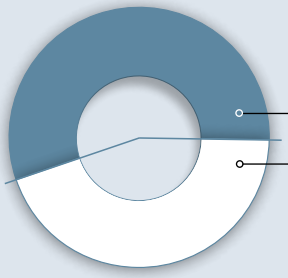
Most importantly, the event provided an avenue for conversation, with the ultimate goal of creating an external support network for family members and patients that can address emerging psychosocial issues. Event coordinator Renee Halberg, MSW, LCSW, explains that "it's difficult to imagine what it's like to have a child be diagnosed with retinoblastoma. Imagine being told your precious baby has eye cancer that may require chemotherapy and/or the removal of an eye—it's almost unthinkable, which is why this event was created."

Only through the generosity of donors can Duke Eye Center provide its cutting-edge, world-class level of service. Contributions of all sizes allow the Duke Eye Center to conduct research and find treatments for every eye condition imaginable. To learn how you can help, please call **919-684-0404.** **dukeeye.org**

TOTAL PATIENT VISITS IN FY 2011:



Duke Eye Center
Ranks in the Top Ten
U.S.News & World Report



FY2011 AWARD FUNDING:

Federal	$8,850,019
Non-Federal	$7,074,083
Total:	$15,924,102

THE EYE CENTER HAS **11** LOCATIONS IN NORTH CAROLINA AND VIRGINIA.

DUKE EYE CENTER LOCATIONS:

Duke Eye Center of Cary
Duke Eye Center at Duke University Medical Center
Duke Eye Center of North Durham
Duke Eye Center of Raleigh
Duke Eye Center of Southpoint
Duke Eye Center at Page Road
Duke Eye Center of Winston-Salem
Duke Center for Vision Correction

RETINA CLINICS:

Danville, Virginia
Fayetteville
Wilmington

HOW TO CONTACT THE EYE CENTER:

// online at dukeeye.org
// patients call: 1-888-ASK-DUKE (275-3853)
// physicians call: 1-800-MED-DUKE (633-3853)
// info@dukeeye.org

Duke Eye Center
Marketing and Public Relations Office
DUMC 3802 Durham, NC 27710
www.dukeeye.org

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This is a fluorescein angiogram negative image of choroideremia, an eye disease that causes retinal degeneration. Choroideremia affects the retinal pigment epithelium (RPE), photoreceptors, and the choroid. It is X-linked recessive, which means that normally males exhibit the disease and females are carriers; in rare cases, females are also affected. Night blindness is an early symptom followed by loss of peripheral vision, depth and color perception, and acuity. Image courtesy of Michael P. Kelly, FOPS, Duke Eye Imaging Labs.