Edward and Gayle Roski share a lighthearted moment at the opening of the newly remodeled clinic that bears their name.

We are fortunate in the passion, quality, and inventiveness of our team. Together we are a community — working with patients, families, philanthropists, physicians, scientists, researchers, caregivers residents, technicians, entrepreneurs, managers, and many others.

None of this would have been possible without your support. We salute you and thank you!
VISION IS OUR MISSION

PRESERVE
The USC Roski Eye Institute diagnoses, treats and manages the most complex eye conditions, from in utero to advanced age.

PROTECT
The USC Roski Eye Institute leads major research in the epidemiology of eye disease to help prevent blindness.

RESTORE
The USC Roski Eye Institute integrates and applies emerging technologies to develop new methods to restore sight to the blind.

FULFILLMENT OF OUR MISSION IS BEST EXPRESSED IN THE REMARKABLE TRIUMPHS OF OUR PATIENTS. PLEASE READ THEIR STORIES IN THE PAGES AHEAD.

HIGHLY SPECIALIZED CARE FOR ADULTS & CHILDREN
The USC Roski Eye Institute treats the full spectrum of eye conditions — from the most common to the most complex.

- CATARACT
- CORNEA AND EXTERNAL DISEASES
- GLAUCOMA
- LASER VISION CORRECTION
- LOW VISION REHABILITATION
- NEURO-OPHTHALMOLOGY AND ADULT STRABISMUS
- OCULAR ONCOLOGY
- OCULOFACIAL PLASTIC SURGERY
- OPHTHALMIC MOLECULAR AND IMMUNOPATHOLOGY
- PEDIATRIC OPHTHALMOLOGY
- SPECIALTY CONTACT LENSES AND PROSE*
- UVEITIS AND OCULAR INFLAMMATION
- VITREORETINAL SURGERY AND RETINAL DISEASE

*USC Roski Eye Institute is the only PROSE location in California
MAJOR ACCOLADES AND ACHIEVEMENTS

SUPERDOCTORS®
SOUTHERN CALIFORNIA 2017
RISING STARS® EDITION
7 USC Roski Eye Institute physicians were voted “rising stars” by their peers

NANOS YOUNG INVESTIGATOR AWARD
PRESENTED TO
KIMBERLY GOKOFFSKI, MD, PHD

TOP DOCTORS 2017
24 USC ROSKI EYE INSTITUTE PHYSICIANS WERE NAMED AMONG THE BEST

4 OF TOP 10 MOST TALKED ABOUT JAMA ARTICLES OF 2016
USC ROSKI EYE INSTITUTE PUBLISHED RESEARCH

#2
IN RESEARCH FUNDING 2015 AND 2016
by the National Eye Institute

NAI Fellowship Medallion
AWARDED TO
MARK S. HUMAYUN, MD, PHD
The nation’s highest honor for technology achievement

UP AND COMERS POWER LIST 2017
AWARDED TO
AMIR KASHANI, MD, PHD
by The Ophthalmologist

(from left) Andrew H. Hirshfeld, U.S. Commissioner for Patents, Mark Humayun, MD, PhD, Paul R. Sanberg, President of NAI
**REDUCING INFANT BLINDNESS THROUGH INNOVATIVE TELEMEDICINE**

Infants in Armenia are three times more likely to suffer blindness than those born in the United States. To preserve precious eyesight, Thomas C. Lee, MD, Director of the Vision Center at Children’s Hospital Los Angeles, applies advanced technology to train Armenian surgeons remotely, in partnership with the Armenian Eye Care Project.

From his office 7,000 miles away, Lee views surgeries in real time, communicates face-to-face with surgeons, and shares medical files. Under Lee’s leadership, Armenian eye surgeons are gaining the skills and building the confidence they need to save infants’ vision.

Although Lee’s technology partner, SADA Systems, won a Microsoft 2017 Health Innovation Award for its efforts, the true winners are Armenian infants who will grow up seeing the world of wonder around them.

**DELIVERING CLINICAL BREAKTHROUGHS FROM LABORATORY TO PATIENT**

When Alena Reznik, MD, and Sahar Bedrood, MD, PhD, implanted the new XEN® gel stent, it was a triumph for glaucoma patients in Los Angeles County, and the final step on the path of innovation.

At the gel stent’s inception, Rohit Varma, MD, MPH, advised AqueSys, Inc. on its design and application. The USC Roski Eye Institute conducted clinical trials, and analyzed data that demonstrated its effectiveness, leading to FDA approval. Finally, when XEN came on the market, Reznik and Bedrood were proud to be among the first to provide it to patients.

The minimally invasive, outpatient surgical option is a game changer for glaucoma patients whose intra-ocular pressure (IOP) cannot be managed by medications or laser treatment. It holds great promise for the nearly 70 billion people worldwide estimated to have glaucoma.
Maurice Randall

Advanced Primary Open-Angle Glaucoma and Cataracts in Both Eyes

OCULAR HISTORY
Presented with advanced peripheral vision loss and decreased vision in both eyes despite taking all available glaucoma medications.

TREATMENT
Underwent cataract extraction and iStent® placement in his left eye and cataract extraction with XEN® gel stent placement in his right eye.

OUTCOME
Eye pressure is well controlled, and vision is 20/20 in both eyes.

“ The improvement in my vision is amazing. It changed my life.”  
Maurice Randall

Maurice Randall suspected that his vision was getting worse. Sharon, his wife of 35 years, also noticed that something wasn’t right, so Maurice had his eyes examined. He was diagnosed with glaucoma.

The Randalls decided to travel 115 miles from their home in Bakersfield to the USC Roski Eye Institute because of its excellent reputation. Charles Flowers, Jr., MD, and Alena Reznik, MD, determined that Maurice had glaucoma and cataracts in both eyes. They proposed a treatment plan that would greatly improve his vision. The Randalls agreed.

Dr. Flowers removed Maurice’s cataracts and performed LASIK surgery. Dr. Reznik implanted specialized stents to decrease Maurice’s eye pressure and reduce his dependence on daily eye drops. Maurice noticed a vast improvement in his vision just one day after the procedures. Now his eye pressure is under control and his vision is 20/20.

After more than 30 years as an accountant, Maurice recently joined his wife, a former school teacher, in retirement. They are planning to “see the world” together, and now can realize that dream more vividly.

The iStent® Procedure involves implanting a tiny titanium device that reduces intraocular pressure by creating a bypass between the front part of the eye and its drainage pathway.

Charles Flowers, Jr., MD, left, and Alena Reznik, MD, right, worked together to provide comprehensive treatment of all Maurice’s vision issues.
Ruby Chan was born prematurely and diagnosed with cancer in both of her eyes. At the time of Ruby’s diagnosis she was barely three months old. Ruby’s parents, Michael and Nellie, began their search for the perfect doctor, which led them to Jesse Berry, MD.

Retinoblastoma is diagnosed under five years of age, typically around 18 months. A third of the time it affects both eyes, which involves a genetic mutation. The unique element with Ruby’s condition is that her premature birth allowed for an earlier diagnosis, enabling more vision to be saved. Ruby’s parents knew that their daughter was in good hands right from the start. Jesse Berry, MD, created a customized treatment plan and made them feel right at home.

Dr. Berry performed three rounds of chemotherapy and multiple cycles of laser therapy to keep Ruby’s tumors under control. She now has near-normal vision in both eyes, with a full recovery expected soon!

Ruby enjoys going to Disneyland and loves playing with Nemo. After three years, Ruby’s parents are very much looking forward to officially saying ‘cancer free’ once and for all.

“**We have felt empowered from the very first appointment.**” Nellie Chan, Ruby’s mother

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“**We have felt empowered from the very first appointment.**” Nellie Chan, Ruby’s mother

Bilateral Retinoblastoma

**OCULAR HISTORY**

Bilateral retinoblastoma, the right eye involves the macula.

**TREATMENT**

Chemotherapy and laser therapy every three to four weeks since birth.

**OUTCOME**

Both eyes stable and saved from cancer. She recently needed a few more sessions of laser therapy but has been stable since, looking forward to using the word ‘cured’ soon.

Ruby’s right eye has limited vision but the tumor in the left spared the macula, she can see well in the left eye.

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COMBATING EYE INJURIES WITH A REVERSIBLE SUPERGLUE

The hydrogel ocular patch is being developed to treat battlefield injuries resulting in laceration of all layers of eye tissue. Funded by the Department of Defense, research at the USC Roski Eye Institute recently marked an important milestone toward making this treatment a reality.

Jack Whalen, PhD, led a workshop in which 44 military ophthalmologists, medics and corpsmen tested the new technology in a laboratory model of severe ocular trauma. They provided valuable feedback that will be used to enhance the final design that will be accelerated toward clinical trials. The sealant for ocular trauma was recently published and featured on the cover of the prestigious Science and Translational Medicine journal.

The hydrogel patch is a major advance that promises to improve response to eye trauma, not only for military personnel, but also for anyone whose vision is threatened by serious injury.

A new hydrogel developed by researchers can treat patients in the field before they have access to a hospital.

REVOLUTIONARY METHODS TO EVALUATE & IMPROVE TREATMENT

Do LASIK Xtra procedures protect patients from corneal-distorting disorders? The answer has been under debate. Recently USC Roski Eye Institute researchers provided new evidence that the procedure does not stiffen the cornea, and consequently does not provide protection.

While this finding has significant implications for patient care, how it was discovered is equally important. Researchers used Brillouin microscopy, a new method that can measure the strength of the cornea in patients without touching or disturbing it. Only three U.S. institutions have access to the method. One day Brillouin microscopy may allow physicians to create personalized treatment plans for more precise identification of cornea-distorting disorders with the goal of preventing corneal transplantation or even blindness from conditions such as keratoconus, congenital brittle cornea syndrome and pellucid marginal corneal degeneration.
Retinoblastoma (rB) is a cancerous eye tumor whose genetic characteristics are known. To study the genetic changes in a developing tumor, a biopsy is preferred, but often impossible. Research led by Jesse Berry, MD, has suggested a promising alternative. When researchers sequenced and evaluated the nucleic acids in the aqueous humor (AH) in eyes with rB, they discovered that AH contains sufficient tumor-derived DNA to perform genetic analysis. Chromosomal changes from the aqueous humor DNA corroborate the chromosomal changes present in the rB tumor.

Having a surrogate test method may enable scientists and clinicians to define the effects of secondary genetic changes in the tumor as the disease runs its course. Ultimately, this could advance treatment and save the vision of rB patients through early detection.

UCS Roski Eye Institute researchers are growing and imaging retinal organoids, 3D tissue models that mimic the structure and function of the retina, light sensitive tissue found in the back of the eye. Using advanced imaging to study organoid growth in real time, researchers are advancing the understanding of retinal development, and how disease originates and progresses.

Jennifer Aparicio, PhD, and Thomas Lee, MD, developed the organoids that are being studied by David Cobrinik, MD, PhD, and his colleagues. Their novel research method uses noninvasive imaging techniques to provide deeper discovery because tissues can be observed without damage or destruction.
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Severe Vitreomacular Traction

**OCULAR HISTORY**

**Left eye:** Previous retinal detachment and prior surgery elsewhere. Vision lost.

**Right eye:** Previous retinal detachment repair with retained silicone oil, severe glaucoma, and severe vitreomacular traction. Very poor vision.

**TREATMENT**

Removed silicone oil and macular pucker, and placed glaucoma shunt in right eye.

**OUTCOME**

Retina remained attached and macular edema improved after retinal traction was removed. Intraocular pressure decreased. Vision improved.

“Now there’s nothing stopping me from living my dreams.”

Franco Linares

After Franco went blind in his left eye, his other eye was at risk. Starting at age 14, Franco experienced a series of retinal detachments and a cataract in his left eye. Surgeries helped, but eventually his vision could no longer be saved. His right eye was also threatened by previous retinal-detachment surgeries, glaucoma and severe vitreomacular traction. At risk for total blindness, Franco was referred to Linda Lam, MD, MBA, at the USC Roski Eye Institute.

Vision in Franco’s right eye was poor, distorted, and blocked by vitreous debris (floaters). Dr. Lam carefully assessed his condition and developed a conservative plan of treatment. She performed surgery to remove the vitreomacular traction that caused distortion, and implanted a shunt to reduce increased eye pressure from glaucoma. As Franco’s vision cleared, Dr. Lam taught him how to assess potentially blinding vision problems to help ensure early intervention and preservation of sight.

Throughout all his vision problems, Franco kept a positive attitude and channeled his energy into writing poetry and music. At follow-up visits, he shared his work with Dr. Lam. His poetry and music continued to flourish as his vision improved.

Franco is now enrolled in college and serves as a motivational speaker to inspire others with low vision to achieve their life’s dreams. Now that his vision is stable, Franco has set his sights on attending law school.

Optical coherence tomography (OCT) image shows the macular pucker from severe vitreomacular traction that distorted Franco’s vision.

Through skilled surgical care and personal encouragement, Linda A. Lam MD MBA, improved Franco’s vision so he can reach his full potential.
Clinical Education

EXPANDING RESIDENCY OPPORTUNITIES FOR EXCEPTIONAL STUDENTS - RANKED 8TH IN THE NATION

With 21 residents per training cycle, the USC Roski Eye Institute is now one of the largest programs in the nation. In 2017, the Accreditation Council for Graduate Medical Education (ACGME) approved one more permanent ophthalmology residency position.

Our residents receive comprehensive exposure and education in all sub-specialty clinical and surgical areas within ophthalmology. They have a high degree of autonomy in patient care while learning from nationally respected experts.

Each year, more than 400 applicants compete for seven residency positions. The brightest and the best join generations of USC Roski Eye Institute trainees who have gone on to become leaders in ophthalmology.

NEW FULL-TIME FACULTY FOR 2017

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CHALLENGING AND REWARDING OPPORTUNITIES

Training is provided at four hospitals, including the USC Roski Eye Institute at Keck Medical Center of USC, Children's Hospital Los Angeles (CHLA), Los Angeles County Hospital (LAC), and the VA Downtown Los Angeles Medical Center. These locations offer unparalleled clinical, surgical, and academic opportunities to excel, develop, and achieve educational goals.

USC Roski Eye Institute
Keck Medicine of USC
RECRUITING AND TRAINING TECHNICIANS TO IMPROVE OPHTHALMIC CARE

With the advent of the Ophthalmic Technician Education Program (OTEP), seven students are learning valuable skills through didactic courses and clinical rotations. They will graduate with the abilities and experience to serve patients confidently.

OTEP is meeting a growing need for ophthalmic allied health professionals while creating new opportunities for people in Los Angeles. The USC Roski Eye Institute is reaching out at local schools and community events to increase awareness of the ophthalmic technician profession.

Grants from the USC Good Neighbor Campaign and California Wellness Foundation are supporting our training and community-outreach efforts. As our OTEP graduates take their place as valued members of vision care teams, they will help improve vision care for Southern California's diverse patient population.

AAO 2017 - NEW EXHIBITOR PAVILION HIGHLIGHTS
HISTORY
- 21-year-old man with no past medical or ocular history was punched on the right side of his face three days prior.
- He was seen at an outside hospital ER, where a CT scan was performed without evidence of open globe or orbital fracture. Now presenting for ophthalmological follow-up.
- States he has blurry vision in the right eye.

EXAM FINDINGS
- Pupils RR OU; no RAPD
- Visual Acuity
  - pH 20/400 OD; pH 20/20 OS
  - IOP 19 OD, 19 OS
- Gross exam notable for periorbital ecchymosis, subconjunctival hemorrhage on the right side
- Slit lamp exam otherwise unremarkable
- Right side fundus exam

DIFFERENTIAL DIAGNOSIS
- Traumatic macular hole

ADDITIONAL INVESTIGATIONS
- OCT macula of the right eye

DIAGNOSIS
- Traumatic macular hole

PATHOPHYSIOLOGY
- A traumatic macular hole (TMH) has a different pathophysiology than an idiopathic macular hole (IMH). IMH is a disease of vitreomacular traction caused by pulling of the vitreous on the inner retina. However, studies have shown that TMH infrequently have vitreous detachments or traction. Instead, TMH are thought to occur from blunt trauma that results in a flattening of the globe in the anterior-posterior direction causing a stretching on the perpendicular plane. This physical stretching from a significant impact force causes a development of a hole in the retina (see Figure 3).

TREATMENT
- There is evidence that some traumatic macular holes can be initially observed and may close spontaneously (see Figure 4).
- Surgical treatment requires a pars plana vitrectomy and gas tamponade. Prone positioning is required as well.
- This patient was observed for two months; however spontaneous closure did not occur. He subsequently underwent pars plana vitrectomy, membrane peel, air-fluid exchange and instillation of SF6 gas. At one month follow-up the retinal hole was closed, with best corrected visual acuity of 20/100.

PROGNOSIS AND FUTURE DIRECTIONS
- Recent studies have shown that TMH may close spontaneously, which often occurs within the first two to three months; if not, surgical closure is required. Large TMH were less likely to close spontaneously and more often required surgical closure. However, studies have been limited by small sample sizes and do not show statistical significance.

REFERENCES

CONTACT
- Andrew Moshfeghi, MD, MBA, associate professor of clinical ophthalmology
  andrew.moshfeghi@med.usc.edu
- Luv Patel, MD, PGY-3 Ophthalmology Resident, luv.patel@med.usc.edu

Figure 1: Right side fundus exam showing disrupted foveal contour, macular hole. Otherwise fundus exam OD unremarkable, exam OS unremarkable.

Figure 2: OCT macula of the right eye at level of the fovea showing macular hole with no evidence of posterior vitreous detachment or traction. A cuff of subretinal fluid is present without intraretinal cysts.

Figure 3: IMH most often occurs in older patients (due to vitreous syneresis and traction). TMH tends to occur in younger male patients, the demographic most likely to undergo blunt facial trauma.

Figure 4: OCT macula right eye at level of fovea POM1. Macular hole is closed. There is disrupted foveal contour with significant centreal outer nuclear, ellipsoid zone and RPE loss.
SAVING CHILDREN with STRABISMUS through a GENEROUS Gift

Children with strabismus, commonly known as crossed eyes, face serious developmental, psychological and social challenges. To improve their lives, USC Trustee Glorya Kaufman established a fund to help ensure that children in Southern California with strabismus will receive the diagnosis and care they deserve.

Glorya Kaufman’s gift enables the USC Roski Eye Institute to reach out to our community to provide eye surgeries for children from 1 to 18 years old with strabismus, who might not otherwise be able to afford specialized care.

When strabismus is addressed early, a child’s eyes and brain have a greater ability to re-learn how to work together. Timely treatment made possible by Glorya Kaufman will enable many children to enjoy fuller, more productive lives.

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  - 3335 S. Figueroa Street, Unit E Los Angeles, CA 90007
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