
Of all human senses, perhaps the most treasured.

The loss of sight, the most feared of all disabilities.

Our eyes are our windows to the universe, a pathway to the world around us.

Our vision truly is a miraculous gift of images and insights.

It gives light and form, color and dimension to the wonders of nature and of mankind.

Precious, fragile sight.

More than 40 million people throughout the world are blind.

Millions more have severe, irreversible visual impairment.

A tragic loss. A staggering impact — physically, emotionally, even economically.

But there is great progress. And healing. And hope.

Ophthalmology and vision research have produced dramatic breakthroughs to challenge and conquer blinding eye disease. At the forefront of that challenge is the Louisiana State University Eye Center.
The LSU Eye Center is a vision brought to reality — a vision of excellence.

In 1978, Herbert E. Kaufman, M.D. began the development of this exceptional institution. The LSU Eye Center was the first Center of Excellence created within the Louisiana State University Medical Center. Under Dr. Kaufman’s direction, the Eye Center has become internationally renowned as a comprehensive ophthalmic medical center achieving the highest standards in patient care, in medical education, and in research to preserve and restore sight.

Boyd Professor and Head of the LSU Medical Center Department of Ophthalmology, Dr. Kaufman has brought together the finest minds in ophthalmology and in vision research. This distinguished faculty of physicians and scientists, working together, has expanded the frontiers of medical knowledge. Treatments and surgeries developed here have set the standard for specialized ophthalmic care, and have become part of the world’s arsenal in the fight against blinding eye diseases.

Dr. Kaufman’s own research has produced spectacular advances in eye care, prevention of blindness, and an improved quality of life for millions of people. While studying viral eye infections, he developed the world’s first effective antiviral drug. His formulas for preservative solutions to store donor corneas have enabled modern eye bank networks to bring sight-saving cornea transplant surgery to more people than ever before. Dr. Kaufman’s discoveries with the specular microscope led to dramatic improvements in cataract surgery. He has developed therapeutic contact lenses and new methods for delivering drugs to the eye.

In the field of refractive surgery to correct vision problems, Dr. Kaufman and his faculty have led the development of breakthrough procedures such as epikeratophakia — “living contact lens” surgery in which a corrective lens shaped from a donor cornea is sewn directly onto the surface of the eye — and excimer laser surgery to correct myopia.

This distinguished faculty of physicians and scientists, working together, has expanded the frontiers of medical knowledge.
In 1992, Dr. Kaufman was selected to perform the first surgeries in the United States to implant a special lens for patients with profound myopia. Dr. Kaufman was honored with the prestigious “Innovators Award” from the American Society for Cataract and Refractive Surgery for his landmark contributions to ophthalmology.
Caring for patients with eye disease is a primary mission of the LSU Eye Center, and an integral part of our research and medical education programs. Diagnostic procedures and treatments developed at LSU have given vision and hope to our own patients and thousands of others throughout the world.

Our clinical services cover every aspect of medical and surgical eye care, reflecting the faculty's expertise in the subspecialties of ophthalmology. The LSU Eye Center is a noted referral or tertiary care institution. Many patients are referred to LSU for consultation and treatment of difficult ophthalmic problems by ophthalmologists, physicians in other specialties, and optometrists.

Patient care services have grown dramatically since the Eye Center was founded. More than 22,000 patients visit the LSU Eye Center each year from Louisiana, from across the United States, and from many foreign countries. Clinical care is provided in
the LSU Eye Center's state-of-the-art facilities. For the convenience of our patients, many outpatient surgical procedures may be performed in the LSU Eye Center's own ambulatory surgery center.

**MEDICAL SUBSPECIALTY SERVICES**

Cornea and External Eye Disease  
Cataract and Implant Surgery  
Glaucoma  
Neuro-Ophthalmology  
Orbit and Oculoplastic Surgery  
Pediatric Ophthalmology and Strabismus  
Medical Retina • Diabetes • Uveitis  
Retina and Vitreous Surgery

**OPHTHALMIC SERVICES**

Ultrasound  
Orthoptics  
Diagnostic Photography  
Electrophysiology  
Visual Fields Testing  
Contact Lens  
Low Vision
The LSU Eye Center’s teaching program is a cornerstone of the institution’s mission and its outstanding reputation. Dedicated to educational excellence at all levels of medical training, our faculty teaches the physicians, ophthalmologists and research scientists of tomorrow. The Eye Center also provides continuing medical education to practicing ophthalmologists and other eye care professionals.

MEDICAL EDUCATION

The Eye Center faculty instructs all LSU medical students in an introduction to the ophthalmic diagnosis and treatment techniques required of a general physician. At the Eye Center, these doctors in training also gain practical experience in how to examine and treat patients. Our faculty also trains selected medical students who pursue additional, elective work in ophthalmology.

THE LSU RESIDENCY IN OPHTHALMOLOGY

The LSU Residency in Ophthalmology is one of the most sought-after in the country. Under the direction of Dr. Donald R. Bergsma, the four-year program is designed to ensure enriched academic and clinical experiences and the opportunity for residents to become an integral part of the Eye Center’s research projects. Only five first-year residents are selected each year from among several hundred applicants.

These physicians receive comprehensive, individual instruction in all aspects of ophthalmology as well as training on specialty services such as cornea and cataract surgery, glaucoma, pediatric ophthalmology, neuro-ophthalmology, ocular plastic surgery, and retinal diseases and surgery. Many LSU ophthalmology residents choose to practice here in Louisiana, and the citizens of our state benefit from the excellence of their medical education.
Fellowships in Ophthalmology

Ophthalmologists from across the United States and around the world seek post-residency training at the LSU Eye Center to gain further experience in the various subspecialties of eye disease, surgery and research. At LSU, fellows further refine the skills they will need as practicing clinicians or in academic medicine.

Fellows work closely with faculty physicians in caring for patients, participate in basic science and clinical research, and assist in training ophthalmology residents. Many LSU Eye Center fellows go on to head subspecialty services in prestigious medical schools, sharing the expertise gained here with the next generation of ophthalmologists and their patients.

Ophthalmology has made spectacular advances in recent decades and, yet, millions of people still lose their sight to blinding eye diseases. Research is the key which will unlock the mysteries of preserving and restoring sight. Only through research can we push away the darkness.

The LSU Eye Center has a preeminent reputation for achievements in research —nationally and internationally. Faculty members have received prestigious medals and other special awards from the most respected academic institu-

"To preserve and renew is almost as noble as to create." —Voltaire, Physicians
tions and scientific associations in the world. Our research studies have expanded the body of medical and scientific knowledge about the eye and the visual system. The Eye Center's physicians and scientists have pioneered new technologies for diagnosis and treatment, and LSU is ranked among the country's top institutions in research grants awarded by the National Institutes of Health.

The LSU Eye Center and our faculty are frequently selected to participate in major multicenter clinical research projects sponsored by the NIH, such as the Early Treatment of Diabetic Retinopathy Study, the Prospective Evaluation of Radial Keratotomy Study, the Study of the Ocular Complications of AIDS, and the Herpetic Eye Disease Study. The LSU Eye Center's comprehensive research program includes landmark work in diseases of the anterior segment, correction of refractive error, retinal disease, glaucoma, immunology, viral disease and antiviral drugs, polymer science and drug delivery.

**ANTERIOR SEGMENT: GATEWAY TO THE VISUAL SYSTEM**

The cornea is a transparent miracle, the gateway to our extraordinary visual system. Protecting the eye like a watch crystal, the cornea refracts or bends light rays and focuses them on the retina at the back of the eye. A subtle abnormality in the shape of the cornea can dramatically affect vision. A diseased or traumatized cornea can lead to permanent loss of vision, often requiring a cornea transplant. The LSU Eye Center faculty is internationally recognized for achievements in corneal surgery and research. The physicians on the Eye Center Cornea Service are Dr. Herbert E. Kaufman, Dr. Marguerite B. McDonald, Dr. Bruce A. Barron, Dr. Donald R. Bergsma, and Dr. Michael S. Insler.

**CORNEA TRANSPLANT SURGERY AND CORNEAL PRESERVATION**

**CORNEAL INFLAMMATION**

Dr. Herbert Kaufman's research has revolutionized cornea transplant surgery. Previously, this sight-saving procedure was severely limited because donor corneas had to be transplanted within twenty-four hours, and were often of questionable health. With Dr. Kaufman's development of preservative solutions, cornea tissue
now can be stored for up to ten days in a healthy condition. Cornea transplants are now the most common transplant surgery in the country.

The LSU Eye Center faculty continues its leadership role in the study of corneal preservation. Research scientists Dr. Roger Beuerman and Dr. Bryan Gebhardt are investigating further improvements in the storage solutions, the use of growth factors to stimulate healing, and ways to prevent corneal graft rejection.

Research scientist Dr. Haydee Bazan also is highly regarded for her corneal research. Dr. Bazan's studies are investigating the biochemical basis or mechanism for the generation and control of corneal inflammation.

**CATARACTS AND INTRAOCULAR LENSES**

The LSU Eye Center faculty specializing in the cornea has developed methods to make cataract surgery safer and more effective. When the eye's natural crystalline lens behind the iris becomes cloudy and opaque, it is called a cataract. The clouded lens is usually removed and replaced with an artificial lens to restore focus and good vision.

Through the development of the clinical specular microscope, our faculty was the first to discover that the insertion of the intraocular lens could damage the important inner layer of the cornea, called the endothelium, which is essential to vision. LSU physicians and scientists are working with growth factors to stimulate cell division and renew the damaged area. They have developed viscoelastic coatings and modifications to cataract surgery which help prevent damage to this delicate and irreplaceable cell layer. Research continues to further refine the design and materials of intraocular lenses for improved success and safety.
CORNEAL PHYSIOLOGY

LSU Eye Center scientist Dr. Stephen D. Klyce has led the development of computer-assisted methods of examining and analyzing the shape or topography of the cornea.

These corneal "maps" have become essential tools in the planning and evaluation of refractive surgery to correct vision problems. The topography mapping system also facilitates research to improve the design and materials of contact lenses, and the fitting of contact lenses for patients with special needs. Additional contact lens research is being conducted by Dr. Raymond Myers, the Eye Center's optometrist, who has special expertise in this area.

REFRACTIVE SURGERY

The LSU Eye Center's advances in the correction of refractive error have been nothing short of remarkable. Many ophthalmologists come to LSU for continuing medical education in the latest refractive surgery techniques.

The Eye Center developed epikeratophakia, "living contact lens" surgery which has been especially important in restoring focus for infants and children with congenital or traumatic cataracts who are too young to receive an intraocular lens. Unless these young patients have focus restored, their binocular visual system will never properly develop. The Eye Center was selected as one of the principal investigation sites for the NIH study on the Prospective Evaluation of Radial Keratotomy, a surgical procedure to correct myopia, or nearsightedness. Dr. Marguerite McDonald, Director of the LSU Eye Center Cornea Service, has been recognized for her pivotal role in the development of radial keratotomy and other refractive surgical procedures.

The most dramatic recent development in refractive surgery was pioneered here at the LSU Eye Center: excimer laser surgery.
EXCIMER LASER SURGERY

Dr. Marguerite McDonald performed the world’s first excimer laser surgery to correct myopia by changing the shape of the cornea. Lasers have been used in ophthalmology for a number of years, primarily to cauterize and seal leaking retinal blood vessels in the back of the eye and to treat glaucoma. The excimer laser, previously used to manufacture minute computer chips, is the first laser which can be used on the clear cornea without causing it to opacify. The excimer is a “cold” laser, using high frequency ultraviolet light rays to break apart the molecular bonds of cornea cells with exquisite precision, removing tiny, targeted areas without harming any surrounding tissue. This procedure is called photorefractive keratectomy, or PRK.

Dr. McDonald and the excimer laser team have had outstanding results in more than eight years of research and clinical trials. The corneal topographical mapping system developed by Dr. Klyce at the Eye Center is an essential part of the technology for delicately reshaping the cornea with the excimer laser. In less than sixty seconds, patients can be free from glasses or contact lenses. The excimer laser also is effective as a therapeutic technology for removing corneal scars or treating diseases which might otherwise require a more involved corneal transplant.

REFRACTIVE SURGERY: THE FUTURE

The LSU Eye Center is continuing to refine and improve several refractive surgery procedures, including the excimer laser. Further research will study ways to adapt this extraordinary laser technology for the correction of farsightedness and astigmatism.

Other research at the Eye Center also holds great promise for the correction of refractive errors. Dr. Jean Jacob-LaBarre, the LSU Eye Center’s specialist in polymer chemistry, is developing artificial cornea tissue...
for refractive surgery which would allow a greater range of correction and eliminate problems of tissue supply and preservation. Dr. Jacob-LaBarre is also working on a polymer “sling” for use in the surgical management of pathological myopia, a condition in which the back of the eye stretches and vision is compromised. This sling will help stabilize the condition and prevent damage to the retina which can lead to blindness.

Dr. Herbert Kaufman and the LSU Eye Center were chosen to perform the first surgeries in the United States to test a new implant lens for profound myopia — nearsightedness too severe to be corrected either by radial keratotomy or the excimer laser. In this first phase of clinical trials under FDA guidelines, a prescription lens made from the same plastic as a hard contact lens is implanted beneath the cornea and over the pupil. Unlike cataract lens implants, this device does not replace the eye’s natural lens. This new surgery may hold the first hope for people so nearsighted they can only see a few inches in front of their eyes.

DISEASES OF THE RETINA

Retinal diseases and degeneration are among the most challenging areas in both research and patient care. The retina is the fragile, nerve-rich layer of tissue lining the back wall of the eye. The retina receives light and changes it into electrical signals, a neural language which is communicated to the brain through the optic nerve. Retinal disorders are all the more tragic and frustrating because,
to date, there have been no definitive treatments. Today, the LSU Eye Center is in the forefront of retinal research.

THE ERNEST C. AND YVETTE C. VILLERE CHAIR FOR THE STUDY OF RETINAL DEGENERATIONS

Nicolas G. Bazan, M.D., Ph.D., is the Eye Center’s Villere Professor of Ophthalmology. The chair was endowed by a dedicated New Orleans couple who recognized that only through research can we conquer blindness caused by such retinal diseases as the inherited disorder retinitis pigmentosa (RP), and macular degeneration. Dr. Bazan studies the metabolic function of the retina, utilizing biochemical, cell biological and molecular approaches with the goal of developing treatments or perhaps even preventative strategies for these blinding diseases.

Dr. Bazan, along with Dr. Elena Rodriguez de Turco and the retinal research group, has identified a vital inter-organ connection between the liver and the retina which sustains retinal function with delivery of DHA, a fatty acid, to the retina. This delivery system, which breaks down in retinal degenerative diseases, may be rebuilt with the development of new drugs.

Although part of the eye, the retina is an integral part of the brain as well. In Dr. Bazan’s laboratories, other LSU Eye Center research projects study how retinal cells communicate with each other and with other parts of the brain, the role of nutrition in vision, and degeneration of the brain itself in seizure disorders such as epilepsy. Dr. Bazan has also been named Director of LSU’s developing Neuroscience Center of Excellence, the only one of its kind in the region. The center will continue multidiscipline, innovative brain cell research in such important areas as stroke, trauma, and Alzheimer’s disease.
**Retinal Cell Transplant Research**

Dr. Gholam Peyman, the Eye Center's Chief of Retina and Vitreous Surgery, is studying a delicate new transplant surgery which may hold the first hope for the treatment of age-related macular degeneration and perhaps for retinitis pigmentosa and other retinal diseases as well.

The macula is the tiny central part of the retina responsible for sharp central vision and color vision. A leading cause of vision loss in older age groups, macular degeneration, affects the ability to read, drive and see details. As the population ages, macular degeneration will become an even more pervasive problem.

In Dr. Peyman's clinical research, he is transplanting healthy cells from one of the retina's many layers — the pigment epithelium — into the damaged area of the retina. Although still in its early stages, this research shows great promise.

**Diabetic Eye Disease**

It has long been known that diabetes can cause profound changes in the retina which, if not diagnosed and treated, can lead to permanent loss of vision. Dr. Mandi Conway, the Eye Center's specialist in diabetic retinopathy, works closely with patients to ensure that their condition is monitored and clinically managed. Our Neuro-ophthalmologist, Dr. Andrew Lawton, has begun research to identify causative factors in the retinal damage from diabetic eye disease.
**INFECTIONOUS EYE DISEASE**

Dr. Kaufman and the LSU faculty have become world-renowned for their work in viral eye infections, particularly herpetic eye disease. The same virus that causes cold sores also causes serious eye infections and corneal scarring. Because the herpes virus can remain dormant in the nervous system, patients are at risk of recurrent infections and cumulative corneal damage. More than 500,000 Americans have herpetic eye disease. Dr. Kaufman and the LSU faculty developed the first treatment of viral eye disease and showed the efficacy of the class of drugs on which most other antiviral medications are based. LSU cornea specialist Dr. Bruce Barron has a special interest in ocular infectious diseases. He is a Principal Investigator in the national Herpetic Eye Disease Study to determine the most effective treatments.

Other LSU Eye Center faculty members are continuing work in this important area. Dr. Michael Inslar is studying newer antibiotics and other treatment techniques for infections eye diseases and the development of corneal ulcers. Research scientist Dr. Bryan Gebhardt, a specialist in immunology and microbiology, is studying the immunological aspects of viral eye infections, and ways to prevent recurrence of the disease. Dr. James Hill's research in virology and pharmacology follows the disease processes and chemotherapy of viral and bacterial eye infections.

**THE CONFOCAL MICROSCOPE**

Dr. Roger Beuerman, an Eye Center research scientist specializing in corneal anatomy, has developed a new diagnostic microscope which will surpass even today's most sophisticated instruments. The confocal microscope can be focused directly on the living eye and enables the ophthalmologist to view, not only the individual cells of the cornea, but also any submicroscopic bacteria or amoebae causing an infection, or the process of corneal graft rejection.

- This important new technology, developed here at the LSU Eye Center, is expected to make a significant contribution to ophthalmic patient care and research.
The confocal microscope will facilitate a faster and more accurate diagnosis so that the proper treatment can begin promptly. The technology will also be of great value in evaluating the effects of contact lenses on the cornea, and can even be used to observe the retina and the optic nerve. This important new technology, developed here at the LSU Eye Center, is expected to make a significant contribution to ophthalmic patient care and research.

**Drug Delivery Systems**

LSU Eye Center physicians and scientists have made important advances in developing new and precise methods of delivering healing drugs to the eye. Dr. Herbert Kaufman, Dr. Bryan Gebhardt and Dr. James Hill are working with collagen “shields” shaped like contact lenses, which slowly dissolve and release medication directly onto the eye. Dr. Jean Jacob-LaBarre is developing modifications of the collagen molecule which will enhance the delivery of the medication. Dr. Hill also is studying a unique system of drug delivery called iontophoresis in which a direct current is used to drive drugs into the eye to treat viral and bacterial disease.

LSU Eye Center physicist Dr. Bahram Khooobehi and retina specialist Dr. Gholam Peyman have devised a remarkable liposome system of drug delivery. Potent medications which could have side effects if taken systemically can be encased in a microscopic, heat-sensitive liposome “package” and injected. Travelling through the bloodstream, the liposome stays intact until it reaches the eye. A special laser then breaks apart the liposome, releasing the drug directly to the eye tissues.
Ocular Reconstruction

Dr. Jean Jacob-LaBarre and Dr. David DiLoreto are collaborating on the development of a new artificial eye which not only looks natural, but also can also move like a natural eye. Dr. DiLoreto is the LSU Eye Center's outstanding ocular plastic surgeon specializing in both reconstructive and cosmetic procedures. Damage from trauma or invasive disease can require removal of the patient's eye.

Although artistic skill can create a lifelike prosthesis, it has been difficult to develop materials which can fasten the artificial eye to the ocular muscles so that it moves naturally, in concert with the other eye.

An artificial eye which restores both appearance and function will provide a great benefit for patients both physically and psychologically. The work of Dr. DiLoreto and Dr. Jacob-LaBarre is leading the development of this promising new technology.

Pediatric Research

Early diagnosis and treatment of vision problems is especially important in children so that their visual systems can develop fully and function properly. Dr. Irene Ludwig is the LSU Eye Center's Director of the Pediatric Ophthalmology and Strabismus Service. In addition to her active clinical and surgical practice, Dr. Ludwig is investigating the problem of crossed eyes in children with refractive problems. Her research will lead to a better understanding of the ocular disorder known as accommodative esotropia, and ways to best correct the condition.
In the 18th century, the English painter Sir Joshua Reynolds said that "excellence is the reward of labor." More than 200 years later, his words are still true. The LSU Eye Center has achieved a level of excellence that would not have been possible without the labor and dedication of our outstanding faculty and staff, and the vision of the leaders within the Louisiana State University and the LSU Medical Center.

But excellence is not self-sustaining. It must be nurtured. Excellence in medicine and in education is nurtured by special and essential partnerships.

THE LOUISIANA LIONS EYE FOUNDATION

The Louisiana Lions Eye Foundation has played a major role in the growth and accomplishments of the LSU Eye Center. The Lions organization was among the first to recognize our critical need and the importance of private support for vision research and education. The Foundation and the many Lions families of Louisiana have been essential partners in the fulfillment of the Eye Center's mission.
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The Eye Center's outstanding facility was built by the Louisiana Lions Eye Foundation through the hard work and dedication of Lions clubs throughout the state. Our Lions Eye Research Laboratories are named in honor of the organization's early and continuing support.

In association with the Lions, the LSU Eye Center provides eye care and surgery to thousands of people who could not otherwise afford specialized medical care. Dr. Donald Bergsma is Medical Director of the Lions Eye Service and also Director of the Residency Training Program. Under Dr. Bergsma's supervision, the Lions Eye Service has become a broad-based community resource for outstanding medical care, and an integral part of our teaching program.

**PHILANTHROPIC GIVING**

 Contributions from philanthropic individuals, organizations and corporations have been a vital component of sustaining excellence at the LSU Eye Center. Endowments, gifts and bequests provide resources for faculty support, enable new research initiatives, purchase needed equipment, and ensure the continuing preeminence of the institution. Priceless in any amount, philanthropic donations made through the LSU Medical Center Foundation may be given for unrestricted support of the LSU Eye Center or may be designated for a specific area of research and training.
THE VISIONARY SOCIETY

Among the LSU Eye Center’s special partners are the members of The Visionary Society. The Society was established in 1990 to recognize and honor donors who provide significant annual support. These individuals truly have been visionaries in recognizing the essential role of philanthropy in the Eye Center’s mission to preserve and restore sight.

The LSU Eye Center is deeply grateful to The Visionary Society and to every donor whose commitment and contributions advance our work to prevent blindness.
Envision Soaring Toward
New Financial Horizons –
On the Wings of Excellence

Nancy Lois Shockey

PaineWebber
We invest in relationships.
HOUSTON, TEXAS

In loving memory of John Dwight Shockey.