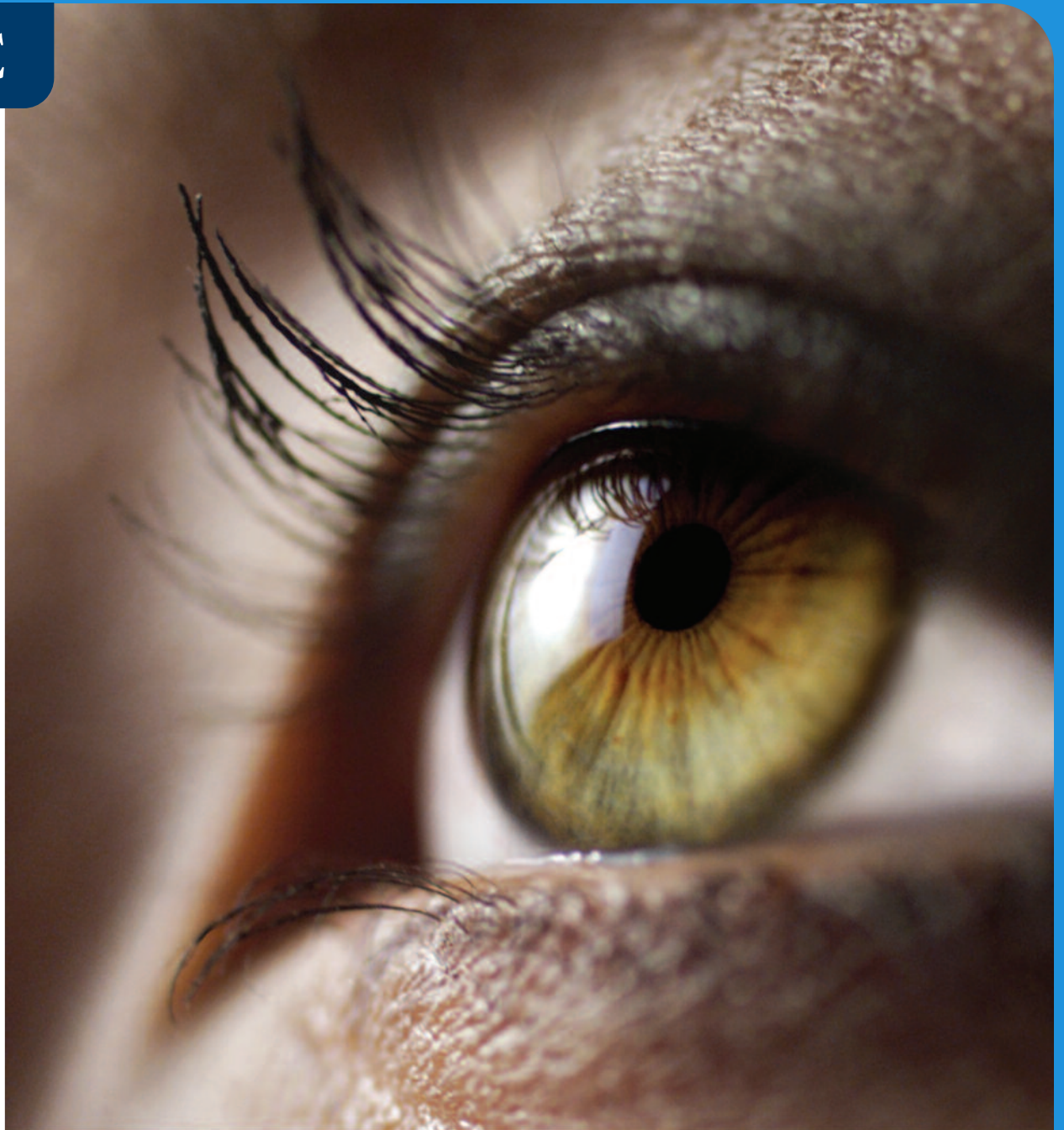


UPMC



## 2009 Highlights

*UPMC Eye Center*

*Department of Ophthalmology*

*University of Pittsburgh  
School of Medicine*

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UPMC Eye Center's mission  
is to improve the quality of  
life through the preservation  
and restoration of vision.

## The Vision of UPMC Eye Center is to:

- be a leader in the delivery of eye care
- advance the frontiers of eye research
- educate current and future generations in the fundamentals and state of the art in eye health, disease, and treatment
- bring innovations in science and technology from the laboratory to our patients

### We achieve these goals in a number of ways:

**Clinical patient care** — UPMC Eye Center values excellent quality care combined with outstanding service. We value and personalize care to each individual patient. It is this dedication that has earned us a reputation for excellence, including being previously recognized as one of the country's top programs by *Ophthalmology Times*.

**Research** — UPMC Eye Center, the Department of Ophthalmology of the University of Pittsburgh School of Medicine, has one of the top basic and clinical research programs in the country. Among the top-ranked programs in the United States in National Eye Institute funding, UPMC Eye Center's research focuses on ocular immunology, infectious diseases, ocular wound healing, molecular biology of retinal and corneal development and disease, glaucoma, and advanced diagnostic technology invention and development.

**Teaching** — UPMC Eye Center has an outstanding teaching program, training six residents per year in a three-year program. Graduates have gone on to clinical, research, and combined clinician-scientist careers. UPMC Eye Center is at the forefront of continuing medical education, providing both ongoing and specialized educational opportunities.



**Joel S. Schuman, MD, FACS**

Director, UPMC Eye Center  
Eye and Ear Foundation  
Professor and Chairman,  
Department of Ophthalmology  
University of Pittsburgh  
School of Medicine

## *Dear Colleague —*

I am pleased to present the UPMC Eye Center, Department of Ophthalmology of the University of Pittsburgh School of Medicine 2009 Highlights.

2008-2009 was an important year for the UPMC Eye Center's research program. We were awarded a renewal on our National Institutes of Health National Eye Institute P30 Core grant. This continues the grant into its 21st year and sustains the operation of five core modules which provide crucial support for vision research at the University of Pittsburgh. An example of such work is the article by James L. Funderburgh, PhD, in *Stem Cell*, "Stem cell therapy restores transparency to defective murine corneas." This article demonstrates the potential for stem cell therapy in restructuring and clearing abnormal hazy mouse corneas, and provides the foundation for potential translation of this work to patients.

As our department continues to grow, we welcomed the following new clinicians:

- [Denise Gallagher, MD, Retina Surgery and Medical Retina Service](#)
- [Jenny \(Yu\) Will, MD, Orbital, Oculoplastics, and Aesthetic Surgery Services](#)

The department continued to promote continuing education opportunities through numerous Continuing Medical Education events, including "Age-Related Macular Degeneration," with keynote speaker, 2008 Muse Prize recipient, Philip Rosenfeld, MD, PhD. Other events included:

- *Anterior Segment 2008*
- *Vision Research Day*
- *Scholars in Vision science research seminar series*
  - > "Differential Roles of Adenovirus-Associated Molecular Patterns in Adenovirus Keratitis,"  
*James Chodosh, MD*
  - > "Pseudomonas Biofilms and Ocular Infection," *Michael Zegens, MD*

The UPMC Eye Center is continually working to increase clinical productivity which, in turn, leads to better clinical outcomes.

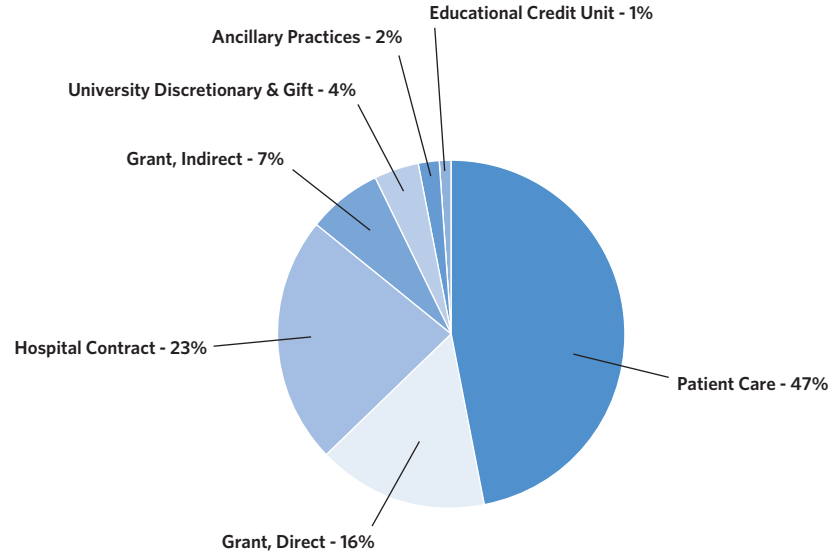
Sincerely,

A handwritten signature in black ink that reads "Joel S. Schuman". The signature is written in a cursive, flowing style.

Joel S. Schuman, MD, FACS

## Revenues

### Consolidated Revenue Mix



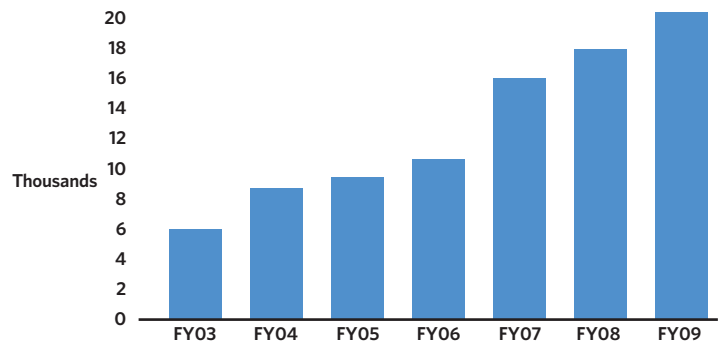
## Productivity of Professional Clinical Services

All core clinical productivity indicators increased substantially during FY09 in comparison with FY08 results, continuing an eight-year favorable trend in professional clinical service growth. The following table illustrates a comparison of FY09 vs. FY08 performance in key clinical service production indicators.

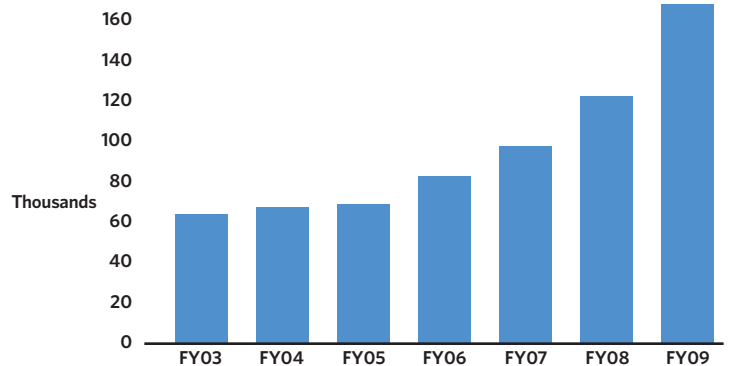
Production Metric	% Growth
Gross Charges	31.7%
Net Payments	14.3%
Work RVUs	14.7%
Clinical Visits	10.9%
Procedures	36.1%
Medical & Testing Services	11.9%

## Patient Care Productivity - Departmental Totals

### Clinical Work RVUs



### Procedures

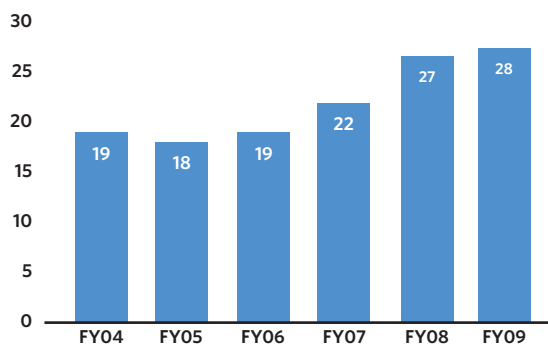


The volume of work RVUs and clinical procedures respectively increased by 15 percent and 37 percent from FY08 to FY09, demonstrating continuation of the favorable growth trends experienced over the past seven fiscal years.

## Patient Care Productivity - Trends per Clinical Faculty Including Fellows

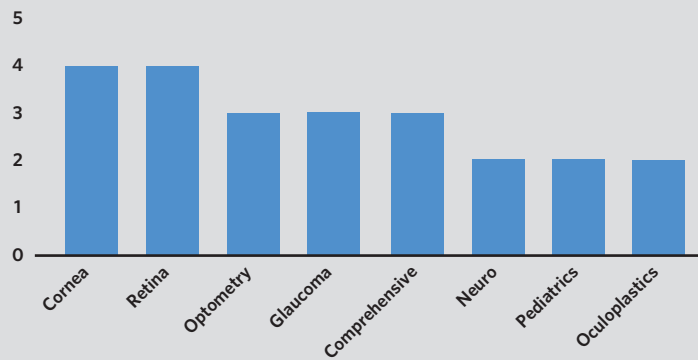
### Department of Ophthalmology, Fiscal Years 2004-2009

Clinical faculty staffing remained consistent from FY04 through FY06, and increased in FY07 through FY09 as a result of successful recruitment seasons, retention, and the establishment of new clinical fellowship programs in Pediatric Ophthalmology and Oculoplastic Surgery. Clinical headcount is comprised of physicians with combined UPMC and School of Medicine employment, and physicians employed solely by UPMC inclusive of clinical fellows. Headcount is defined as the total number of faculty employed at the end of each fiscal year.



## Patient Care Productivity - FY09 Clinical Faculty Metrics Excluding Fellows

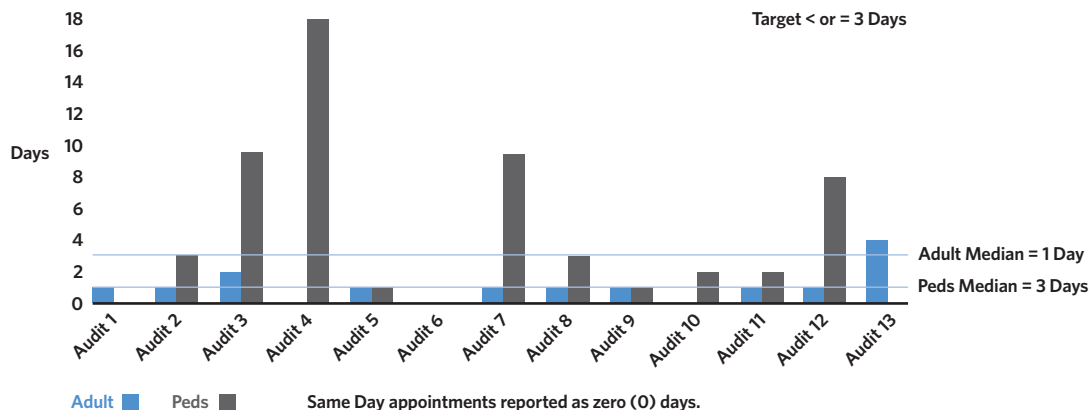
### Clinical Faculty Headcount by Specialty, Excluding Fellows, 2009.



## Availability of Office-Based Care

### Appointment Availability Audit Results, FY09

Compliance with the corporate-wide appointment availability standard of offering an appointment within 72 hours (3 business days) was favorable for both the department's adult and pediatric lines of business.



## Clinical Programs: Focus on Satellite Office Expansion

During FY09, UPMC Eye Center continued its tradition of excellence in clinical program development through the maintenance and enhancement of existing programs designed to broaden service delivery to our patients. Significant attention was afforded to satellite office expansion efforts during FY09 as part of our strategic mission to treat and serve new populations in need of eye care. In addition to the main campus-based practice, UPMC Eye Center offered comprehensive and subspecialty care in seven suburban locations.

## Key Research Accomplishments and Initiatives

During Fiscal Year 2009, the research interests of our faculty continued to expand with several new individual initiatives as well as the opening of a new Center for Vision Restoration. The quality of our departmental research effort is continually enhanced by the collaborative and synergistic nature of our faculty.

### Corneal Wound Healing

Corneal wound healing continues to be a strength of our department, with contributions from Drs. James Funderburgh, Nirmala Sundar-Raj, and Jes Klarlund. These investigators combine skills in biochemistry, cell biology, and cell signaling to address key issues of wound healing including signals inducing epithelial cell movement into wounds; differentiation and extracellular matrix production by keratocytes in wounded corneas; and corneal regeneration through the use of corneal stromal stem cells.

### Infectious Eye Disease

Infectious eye disease is another significant strength of our research faculty. A highly interactive group of investigators including bacterial geneticist, Robert Shanks, PhD; virologists Paul Kinchington, PhD, and Jerold Gordon, MD; and a viral immunologist, Robert Hendricks, PhD, address issues including:

- [the mechanisms of bacterial biofilm formation, development, and evaluation of antiviral drugs and antibiotics for ocular use](#)
- [the contribution of Varicella Zoster proteins to ocular infectivity and immune evasion](#)
- [the role of the immune system in immunopathology in herpes simplex virus type 1 \(HSV-1\) infected corneas, and in the maintenance of HSV-1 latency in sensory neurons](#)

Drs. Shanks and Gordon collaborate closely in developing animal models of ocular bacterial infections, while Drs. Kinchington and Hendricks maintain close collaboration in developing viral reagents to explore host immunity to HSV-1 corneal infections.

### Ophthalmic Imaging

The department's glaucoma imaging group, headed by Eye and Ear Foundation Professor and Chairman Joel Schuman, MD, in collaboration with colleagues Hiroshi Ishikawa, MD; Gadi Wollstein, MD; Larry Kagemann, BME; and Richard Bilonick, PhD, has continued to expand and develop new initiatives. This group continues to be at the forefront of efforts to develop and enhance ocular coherence tomography (OCT) imaging for the diagnosis and monitoring of glaucoma, diabetic retinopathy, age-related macular degeneration, and other ocular diseases. In addition, the group has developed collaborations with departmental colleagues Xiangyun Wei, PhD (using OCT to document zebrafish development); James Funderburgh, PhD (using OCT to quantify corneal inflammation); Dongsheng Yang, PhD (using OCT to measure a new form of eye movement); and Valeria Fu, PhD (using OCT to develop new forms of contrast enhancement).



## New Research Initiatives

The Department of Ophthalmology has a strong focus on research through both recruitment and collaborative interactions among the department's faculty. In Fiscal Year 2009, research projects progressed at an unprecedented rate because of the availability of the department's cutting-edge technology.

Key initiatives include:

- **Hiroshi Ishikawa, MD: Computer vision and image processing on 3D ocular imaging**

Utilizing his software engineering knowledge and expertise, Dr. Ishikawa is investigating various aspects of ocular imaging for better clinical care and understanding of ocular diseases. Based on 3-D OCT images, Dr. Ishikawa is developing various computer algorithms to quantify certain retinal layers, to recover spatial integrity in 3D data, and to register multiple images for accurate comparison. The algorithms save clinicians time and energy when examining and diagnosing patients, and have even been developed into licensed software for image processing devices.

- **Robert Shanks, MD: Molecular virulence mechanisms of ocular pathogens**

Using a sophisticated molecular genetic system that utilizes as a model organism to ask biological questions, Dr. Shanks has focused his research on understanding how opportunistic bacterial pathogens cause eye infections. Currently, this system is being used to identify novel regulatory proteins and pathways that impact the bacteria's ability to adhere to surfaces such as eyelashes and contact lenses and the production of tissue-damaging secreted virulence factors. This research is aimed at providing better treatment of corneal ulcers and the reduction of tissue damage when ulcers do occur.

- **Gadi Wollstein, MD: Ocular imaging in glaucoma**

Dr. Wollstein's research has focused on the clinical testing of glaucoma imaging devices, development of new imaging devices, and improving glaucoma detection through the use of optical coherence tomography (OCT). Using OCT, a high-resolution, noninvasive light microscope, Dr. Wollstein is able to use a variety of filters to scan into the eye in order to see abnormalities or diseases that previously would have gone undetected. In addition, Dr. Wollstein is developing models that will help to detect glaucoma and track how the disease progresses. These tracking models document changes in the eye, and offer tools to detect and follow the disease.

- **Robert Hendricks, MD: Designing an immune response to herpes simplex virus**

Research in Dr. Hendricks' laboratory is focused on herpes simplex keratitis, the leading infectious cause of blindness in the United States. For patients with herpes keratitis, latent or quiescent infections can reactivate and trigger an inflammatory response that leads to scar tissue formation and progressive corneal opacity. Restoration of vision involves corneal transplants, which are rejected at a higher rate in corneas with herpes keratitis. The goal of Dr. Hendricks' laboratory is to determine why the virus recurs, how to control the inflammation, and why individuals with herpes keratitis reject their corneal transplants at a higher rate. This research will lead to better treatment protocols leading to less vision loss.

## Academic Year 2008-2009

Kenneth Adams, DO\*  
Quzi Ahmed, MD  
Alexander Anetakis, MD  
Robert Arffa, MD  
Michael Azar, MD  
David Baker, MD, MPH  
Ivan Baumwell, MD  
Robert Bergren, MD  
Ronald O. Berkman, MD  
Peter Berkowitz, MD  
Richard Bilonick, PhD  
Gabrielle Bonhomme, MD  
Richard Bowers, MD  
Joel Brown, MD  
Daniel Buerger, MD  
David Buerger, MD  
Viet Bui, MD\*  
Larissa Camejo, MD  
Edward Chang, MD  
John Charley, MD  
Kenneth Cheng, MD  
Viki Christopoulos, MD  
Franklin Cignetti, MD  
Garry Condon, MD  
Phillip Coo, MD  
Helen Davis, MD  
Deepinder Dhaliwal, MD  
Bernard Doft, MD  
Yiqin Du, MD

Andrew Eller, MD  
Norman Edelstein, MD\*  
Thomas Friberg, MD  
Lai Ngor (Valeria) Fu, PhD\*  
James Funderburgh, PhD  
Denise Gallagher, MD\*  
Lawrence Gipson, MD  
Jerold Gordon, MD  
Michael Gorin, MD  
Stephen Harvey, PhD  
Robert Hendricks, PhD  
Michael Herceg, DO\*  
Richard Hertle, MD  
Jane Hughes, MD  
Hiroshi Ishikawa, MD  
Lawrence Kagemann, MS, BME  
Jeffrey Karlik, MD  
Dick Katzin, MD  
Paul Kinchington, PhD  
Jes Klarlund, PhD  
Regis Kowalski, MS  
Karen Lauer, MD  
Louis Lobes, Jr., MD  
Xiaoqin (Alexa) Lu, MD  
Craig Luchansky, OD  
Francis Mah, MD  
Kyle McKenna, PhD  
John Mikulla, MD  
Diana Mrvos, MD  
Amy Nau, OD  
James Nesper, MD  
Robert Noecker, MD  
Karl Olsen, MD  
Joseph Paviglianiti, MD  
Scott Portnoy, MD

Pamela Rath, MD  
Chandrappa Reshmi, MD  
Paul Rosenberg, MD  
E. Ronald Salvitti, MD  
Hazem Samy, MD  
Joseph Scherer, MD  
Joel Schuman, MD  
Robert Shanks, PhD  
Steven Siegel, OD  
Marshall Stafford, MD  
S. Tonya Stefko, MD  
Cholappadi Sundar-Raj, OD, PhD  
Nirmala Sundar-Raj, PhD  
Shivalingappa Swamynathan, PhD  
Christin Sylvester, DO  
Edmond Watters, MD  
Evan Waxman, MD, PhD  
Xiangyun Wei, PhD  
Jenny (Yu) Will, MD  
Gadi Wollstein, MD  
Dongsheng Yang, PhD  
Jenny Yu, MD\*  
Jian Zou, PhD

\*New Faculty



## UPMC Eye Center Locations

### UPMC Eye Center

Eye & Ear Institute  
203 Lothrop St.  
Pittsburgh, PA 15213

### UPMC Eye Center Optical Shop

UPMC Presbyterian, Suite 1100  
200 Lothrop St.  
Pittsburgh, PA 15213

### The Children's Eye Center

Children's Hospital of  
Pittsburgh of UPMC  
Children's Hospital Drive  
4401 Penn Ave.  
Pittsburgh, PA 15224

### Children's North

2599 Wexford Bayne Road  
Sewickley, PA 15143

### UPMC Eye Center Bethel Park

1300 Oxford Drive, Suite 1-A  
Bethel Park, PA 15102

### UPMC Eye Center McKeesport

1605 Lincoln Way  
White Oak, PA 15131

### UPMC Eye Center Mercy

UPMC Eye Center Mercy Optical Shop  
1400 Locust St., Suite 3103  
Pittsburgh, PA 15219

### UPMC Eye Center Monroeville

125 Daugherty Drive, Suite 400  
Monroeville, PA 15146

### UPMC Eye Center St. Margaret

Medical Arts Building, Suite 102  
100 Delafield Road  
Pittsburgh, PA 15215

### UPMC Eye Center Wexford

Blaymore 2, Suite 104  
1603 Carmody Court  
Sewickley, PA 15143

# UPMC

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UPMC is an \$8 billion integrated global health enterprise headquartered in Pittsburgh, Pennsylvania, and is one of the leading nonprofit health systems in the United States. As western Pennsylvania's largest employer, with almost 50,000 employees, UPMC is transforming the economy of the region into one based on medicine, research, and technology. By integrating 20 hospitals, 400 doctors' offices and outpatient sites, long-term care facilities, and a major health insurance services division, and in collaboration with its academic partner, the University of Pittsburgh Schools of the Health Sciences, UPMC has advanced the quality and efficiency of health care and developed internationally renowned programs in transplantation, cancer, neurosurgery, psychiatry, orthopaedics, and sports medicine, among others. UPMC is commercializing its medical and technological expertise by nurturing new companies, developing strategic business relationships with some of the world's leading multinational corporations, and expanding into international markets, including Italy, Ireland, the United Kingdom, Cyprus, and Japan. For more information about UPMC, visit our website at [www.upmc.com](http://www.upmc.com).

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