Exploring the relationship between the eye and the brain.

Neuro-ophthalmologist

Byron L. Lam, M.D.

Byron L. Lam, M.D., professor of ophthalmology and director of clinical visual physiology at Bascom Palmer Eye Institute, first became interested in the field of ophthalmology during an inspiring, third-year medical school rotation in neuro-ophthalmology. But it was his fellowship training that had the greatest influence on his medical career.

After receiving his medical degree from Boston University School of Medicine and completing a residency in ophthalmology at University of Iowa Hospitals and Clinics, Lam joined Bascom Palmer as a fellow in neuro-ophthalmology in 1991. The following year he completed a fellowship in hereditary retinal disease at the University of Illinois Eye and Ear Infirmary.

"I didn't know much about retinal dystrophy or electrophysiology at the time," Lam says, noting that the fellowship at the Eye and Ear Infirmary was largely focused on conditions requiring vision function testing, "so I decided to learn more."

Today, about two-thirds of Lam's patients have neuro-ophthalmic disorders. These are disorders that involve the relationship between the eye and the brain. The remaining one-third have retinal dystrophy problems which are hereditary retinal problems that progress over time.

"The common thread between the patients I deal with is visual function testing," says Lam. "That's how you detect and diagnose disorders in patients with unexplained vision loss."

Vision function testing, such as visual electrophysiology testing, can be objective and provide results that the patient cannot consciously alter. The tests, including full-field and multifocal electroretinogram (ERG), electrooculogram (EOG) and visual evoked potential test (VEP), measure electrical signals that occur in the visual system in response to a visual stimulation. "Visual electrophysiology," Lam explains, "is an important, objective way to assess the function of the retinal and visual pathway."

"Vision function testing provides a tremendous benefit in diagnosis," says Lam, who wrote the book Electrophysiology of Vision: Clinical Testing and Applications, published by Taylor Francis in 2005. "But you really must have an expertise in testing."

Multifocal ERG, one of the newer electrophysiology techniques available at Bascom Palmer, allows physicians to measure electronic signals from a certain part of the retina. By determining exactly where decreased function has occurred, more specific treatments can be prescribed.

In addition to his clinical practice, Lam is director of the Bascom Palmer Center for Hereditary Eye Disease and the Florida Inherited Eye Disease Project. The project is part of a nationwide ophthalmic genetic testing network. "Its purpose is three-fold," says Lam. "First, to provide patients with the best information about these genetic diseases; second, to gain insight into their cause; and finally, to conduct research and clinical trials to develop effective treatments for rare genetic diseases of the eye."

Several clinical trials showing significant promise are being conducted at the center. At present, Lam is principal investigator for Bascom Palmer in a multi-center, Phase II trial testing the therapeutic benefits of ciliary neurotrophic factor for patients with retinitis pigmentosa. The human growth factor is delivered through cell implants directly into the vitreous of the eye.

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Lam has also carried out numerous neuro-ophthalmic studies. Recently, Lam completed a series of studies showing patients who have undergone cataract surgery are at increased risk for anterior ischemic optic neuropathy (AION), a condition resulting from damage to the optic nerve that can lead to vision loss.

According to Lam, for patients with AION in one eye who undergo cataract surgery in the other eye, the risk increases four times. "The implication is that once a patient has AION in one eye, we would advise against cataract surgery in the other eye until the cataract becomes very significant," he explains.

Since 1995, Lam has been collecting data on the epidemiology of visual impairment. He has collaborated extensively with David J. Lee, Ph.D., associate professor of epidemiology, public health and ophthalmology at the University of Miami Miller School of

Medicine. This collaboration has resulted in numerous publications on the epidemiology of visual impairment in adults and children and has positioned Lam as one of the few ophthalmologists in the country with extensive experience in the analysis of ophthalmologic data collected by the National Center for Health Statistics.

Currently, Lam is investigating a possible linkage between visual impairment and mortality. His research suggests a correlation between the two. Additionally, it appears there may be a linkage between visual impairment and increased risk for suicide.

"The results from these research studies help to direct public health policy," says Lam. "The information we gather helps determine where to best spend public health dollars."

Lam says interacting with faculty, residents and fellows makes his work at Bascom Palmer interesting and extremely rewarding. "The interaction is great," he says. "The faculty and students are all in the forefront of the field."

What Lam finds most rewarding is discovery that makes a difference. "The most rewarding thing is finding something new. For example, being able to diagnose a difficult case and offer help, or a discovery that can help other patients."

Outside of Bascom Palmer, Lam, a resident of Pinecrest, is focused on his family—his wife, Diane, a biostatistician, and his two young children..