

The super sleuths of vision

Neuro-Ophthalmology

Bascom Palmer's clinical detectives study the links between brain and eye

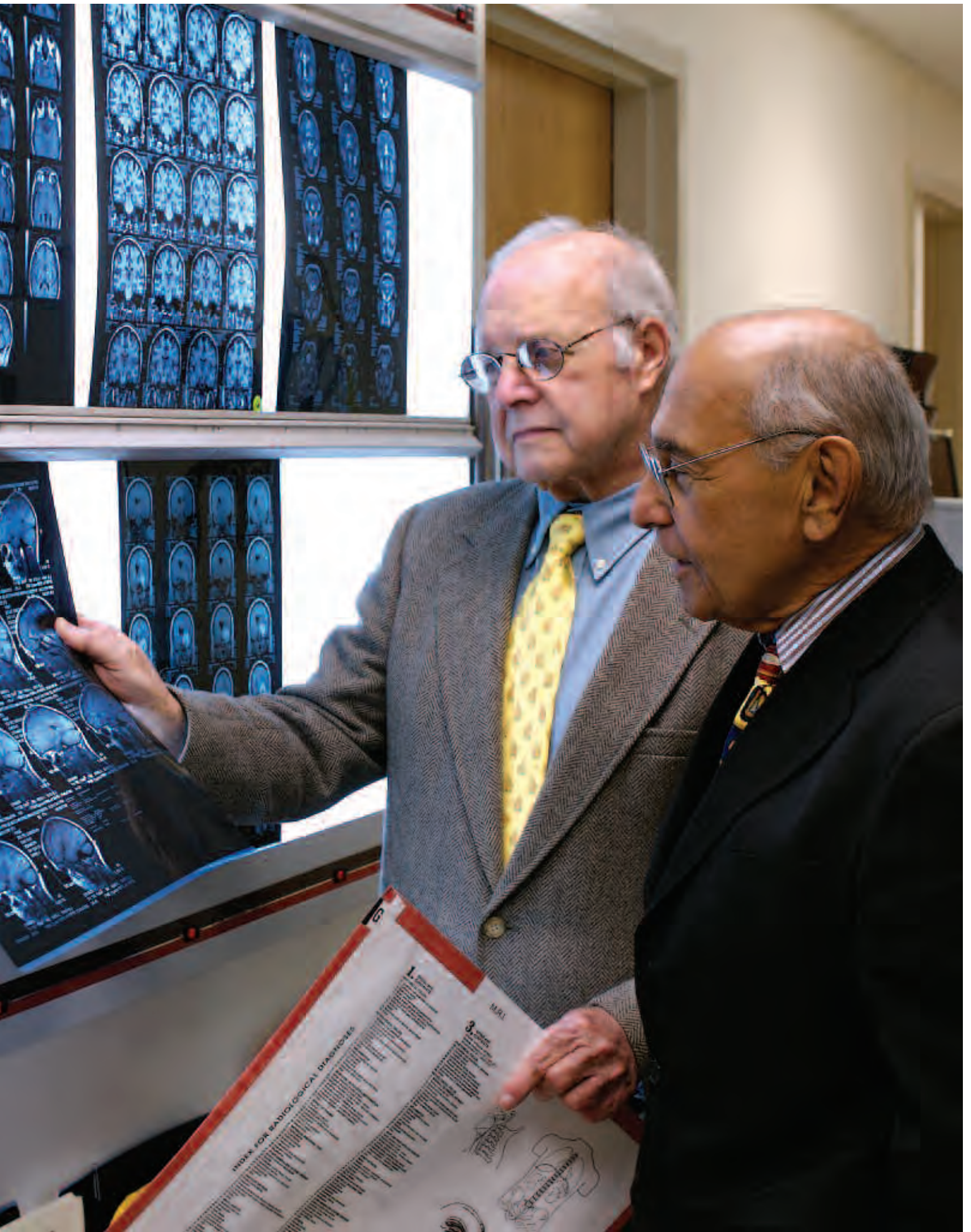
When Miguel Cabrera became concerned about a drooping eyelid last fall, he called his local ophthalmologist, who immediately referred him to Bascom Palmer Eye Institute. After running a series of blood tests, optical scans and brain tests, Norman Schatz, M.D., professor of ophthalmology, diagnosed myasthenia gravis, a serious autoimmune disease whose symptoms include muscle weakness in the face and double vision.

"Myasthenia has protean manifestations and the diagnosis can be difficult because the symptoms can be hard to distinguish from other neurological disorders," said Schatz, one of Bascom Palmer's team of neuro-ophthalmologists. "It's potentially curable with appropriate treatment, but needs to be identified at an early stage because this condition can be life-threatening."

Schatz established the diagnosis and immediately put Cabrera on medication, adjusting the dosage at regular check-ups. "I've seen a big difference so far," said Cabrera, an air-conditioning specialist. "Dr. Schatz really knows his business. He's good at explaining things and he's a character as well, cracking jokes to help relieve the stress for me and my wife."

For more than 45 years, Bascom Palmer's neuro-ophthalmologists have been helping hard-to-diagnose patients like Cabrera, while building one of the world's top programs in this complex field. Unlike other ophthalmic subspecialties, Bascom Palmer's neuro-ophthalmologists look beyond the eye itself, seeking to diagnose and treat disorders of the optic nerve, brain, and blood flow, as well as metabolic problems that affect a patient's vision.

"Neuro-ophthalmology bridges the gap between neurology and ophthalmology," said Joel Glaser, M.D., professor of ophthalmology, who has worked closely with Schatz for decades. "Most ophthalmologists are not trained in neurological disorders and diagnosing the phenomenon as to what goes on behind the eyeball. When faced with conditions like unexplained vision loss or double vision, our specialty comes into play."



Drs. Joel Glaser and Norman Schatz examine MRI images and discuss the pathology in a routine clinical case review.

A medical detective story

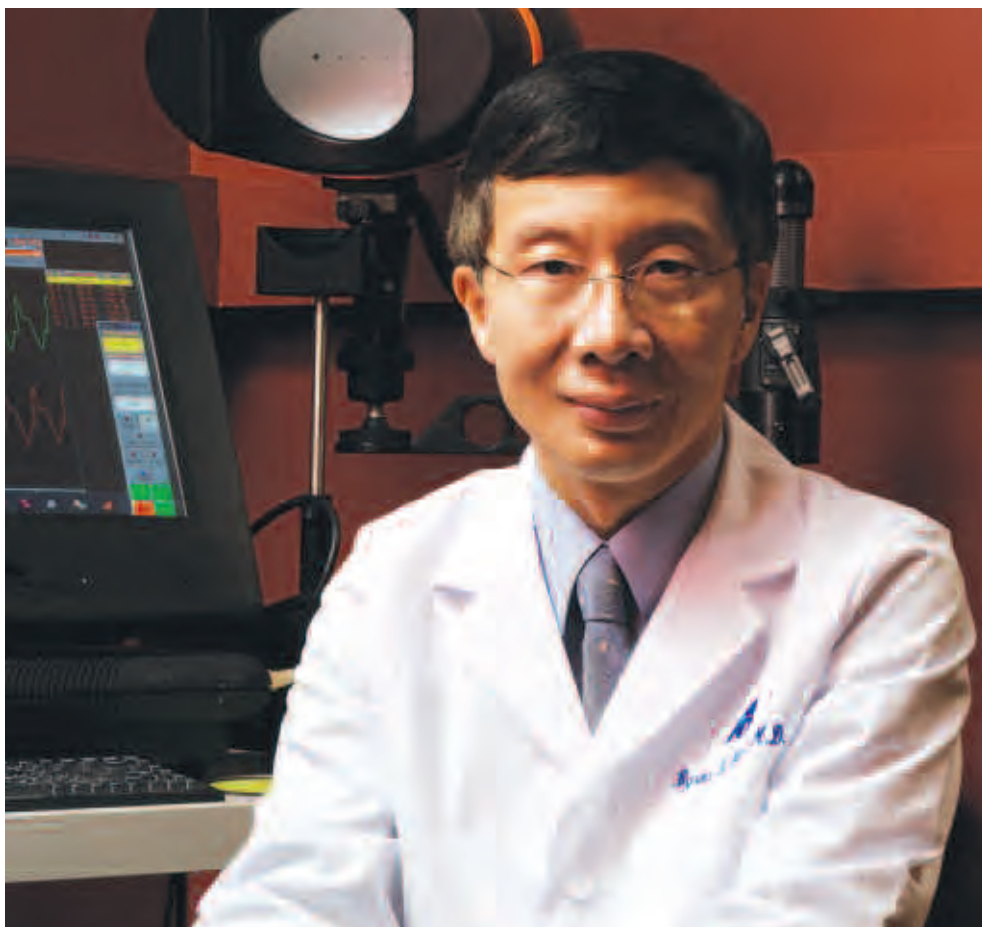
Beverley Gordon has relied on her vision throughout her career. After coming down with the flu, she was treated with antibiotics and finished her treatment. But a month later, she put on her glasses and sensed something was wrong.

“I drove to the school where I am a reading coach and turned on my computer. Everything was blurry,” she said. “I thought at first it was conjunctivitis (pink eye), but my vision didn’t improve.”

Gordon tried a pair of reading glasses without any improvement. When she could not even read the headlines in the Sunday newspaper, she headed for Bascom Palmer’s emergency room. “That was absolutely the best decision I’ve ever made,” she said. “They did some vision tests and scheduled an MRI exam the next day.”

After a series of tests, her problem was identified as optic neuritis, a viral condition caused by an upper respiratory infection. A course of corticosteroids was prescribed that rapidly took care of the problem.

“Now I can really tell the difference. I can read the license plates on the cars in front of me and use the computer again,” Gordon said. “It took some detective work, but the doctors were very careful not to give me a diagnosis before they did the tests. In the meantime, they were very reassuring, telling me all along that it would work out. I really appreciate their care.”



Byron L. Lam, M.D.

In many ways, neuro-ophthalmologists are medical detectives who must interpret clues like blurry vision, migraine headaches or droopy eyelids to identify the “culprit” and find the right solution. After all, “vision” actually occurs in the occipital lobe of the brain, which processes the signals transmitted from the eye through the optic nerve.

Therefore, Bascom Palmer’s neuro-ophthalmologists take plenty of time to thoroughly examine a patient and use the Institute’s sophisticated optical and brain imaging techniques to arrive at a diagnosis. A patient with double vision, for instance, might be treated with a prism lens, medication, or even neurosurgery, depending on the underlying condition.

With four neuro-ophthalmologists on staff, Bascom Palmer has one of the largest programs in the world. “The broad experience of our neuro-ophthalmologists adds an incredible dimension to the types of patients who can be treated,” said Eduardo C. Alfonso, M.D., the Edward W.D. Norton Professor of Ophthalmology and interim chairman of Bascom Palmer. “Our program is an important resource for patients throughout South Florida and beyond.”

A world-class clinical center

After enjoying good eyesight all his life, 74-year-old Joseph Snow, began seeing double, a condition his regular ophthalmologist could not correct.

Snow came to Bascom Palmer, where Joshua Pasol, M.D., assistant professor of clinical ophthalmology, conducted a thorough examination and was able to rule out life-threatening conditions like a brain tumor or carotid artery blockage. “Fortunately, my condition was not serious,” said Snow. “Dr. Pasol prescribed a special lens for my left eye. We filled the prescription and when I put my glasses on, I could see perfectly. I’m very impressed with the treatment I received.”

Every year, the neuro-ophthalmology service at Bascom Palmer treats nearly 4,000 patients for a wide array of conditions, including optic neuritis, an inflammation of the optic nerve that can lead to loss of vision; ocular motility dysfunction, where the movement of the eye is impaired; and abnormalities of the pupil, such as unequal or no contractions in response to light.

“Bascom Palmer is the place to come for complex and unusual cases,” said Pasol, who treats patients in the Institute’s facilities in Miami, Palm Beach Gardens, Naples and Plantation. “We have extensive experience, even with the most rare neuro-ophthalmologic conditions.”

Patients are often referred to Bascom Palmer’s neuro-ophthalmologists for symptoms like visual loss, double vision, or eyelid and facial spasms.

“The biggest category of patients fall into the category of unexplained visual loss,” said Byron L. Lam, M.D., professor of ophthalmology. “Often other ophthalmologic specialists have seen the patients, but have been unable to find the causes of the disturbance.”

For instance, one of Lam’s recent patients was suffering from a loss of central vision. Testing

revealed an unusual condition called fovea cone dystrophy that was affecting the middle of the macula, the tiny retinal area responsible for central vision. Another patient with deteriorating vision was found to have a benign tumor in the brain that was successfully removed by surgery.

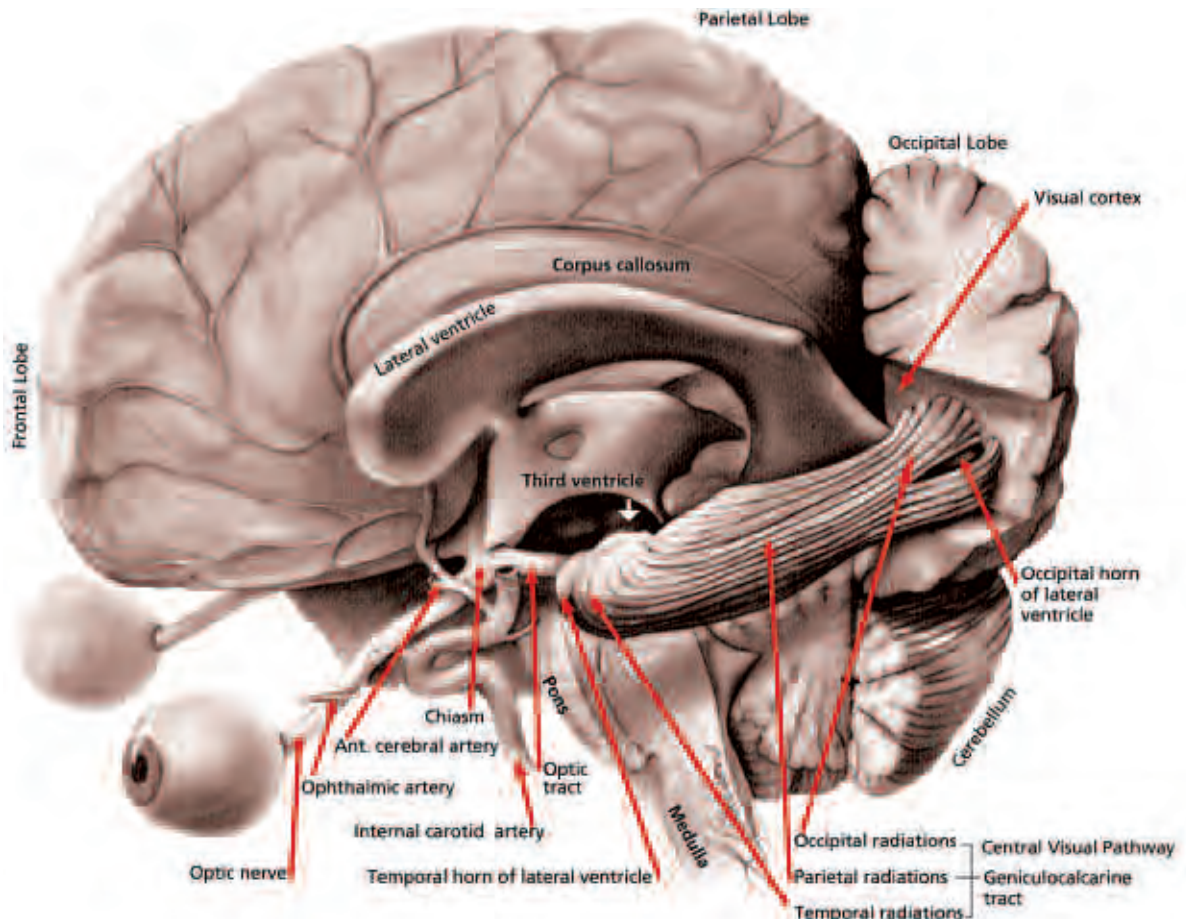
“Neuro-ophthalmologists have learned not to take anything for granted in the diagnosis process,” said Lam. “The more you know about the eye, the better you can identify these types of ‘cross-over’ conditions.”

In most cases, the first step in the diagnostic process is a thorough physical examination and discussion with the patient. “We take the best medical histories of patients because we have to understand their conditions,” said Glaser. “We assess not only the physical signs, but also the order in which the symptoms occurred. By explaining the chronology, the patient gives us important clues about the current condition.”



Joshua Pasol, M.D.

To schedule an appointment with a Bascom Palmer specialist, please call 1-888-845-0002.

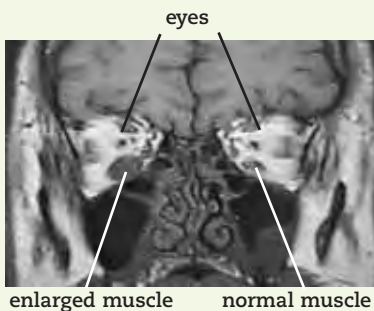




Dr. Lawton Smith and Dr. Mitchell Strominger, a 1993 fellow in neuro-ophthalmology, examine a real skull bone. Dr. Smith is instructing Strominger on the value of CT scans. "Alas, poor Yorick, I knew him well."



MRI of a patient with double vision caused by a large meningioma (white area) of the skull base.



This patient has double vision resulting from Graves' disease. The MRI shows a large eye muscle is causing double vision and keeping the eye from moving properly.

Next come a variety of diagnostic procedures that can include electrophysiology tests, cerebral angiography, blood test and imaging technologies like optical coherence tomography (OCT), as well as CT and MRI scans. "We have top-notch neuroimaging equipment, as well as all the diagnostic resources of the University of Miami Miller School of Medicine," said Glaser. "We believe the buck stops here. At Bascom Palmer, we will find the correct answers."

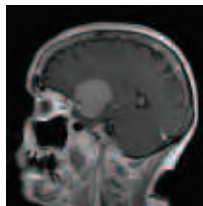
Even with disorders that can't be corrected, such as ischemic optic neuropathy, a type of stroke of the optic nerve, the Institute's neuro-ophthalmologists guide the process of care, while providing information and psychological support to the patient and family.

As Schatz said, "In all types of cases, we teach patients about their conditions and how to take responsibility for their care. No patient leaves the room without understanding the treatment options and being encouraged to think them through. We give them everything we possibly can."

Decades of leadership

Since its earliest days, Bascom Palmer has been a leader in advancing the field of neuro-ophthalmology. In fact, neuro-ophthalmology was one of the main clinical interests of Edward Norton, M.D., who assumed the initial chairmanship of the University of Miami School of Medicine's ophthalmology department in 1958 and founded Bascom Palmer Eye Institute four years later.

A student of neurology at Cornell Medical College, and a survivor of self-diagnosed bulbar polio in 1948, Norton completed a 15-month neurology residency in New York, as well as a residency in retinal surgery. He later studied under David Cogan, M.D., at Harvard University and Frank Walsh, M.D., at Johns Hopkins University – two of the founders of neuro-ophthalmology.



“Ed Norton felt it was a vital specialty because of the links among ophthalmology, neurosurgery and otolaryngology,” wrote Glaser in a 2002 article in the *Journal of Neuro-Ophthalmology*, “The Golden Age of Neuro-Ophthalmology at Bascom Palmer Eye Institute.”

Glaser, whose own ties with Norton date back to 1962 when he was a senior medical student, noted that the ophthalmology department’s original faculty consisted only of Norton and Victor Curtin, M.D., Norton’s lifelong friend and colleague. But the next faculty member recruited was Lawton Smith, M.D., one of the nation’s first neuro-ophthalmologists.

“When I went into this field back then, there were probably only about 10 people practicing neuro-ophthalmology in the world,” said Smith, who came to Bascom Palmer in 1962 and spent 32 years on the faculty before retiring in 1994. “Now there are more than 400 members of the North American Neuro-Ophthalmology Society – a clear indicator of how this field has grown.”

Back in the 1960s, the primary tools for diagnosing neurological disorders were plain skull x-rays, arteriograms and air studies of the brain. “Now you have very precise MRI and CT scans that are far more accurate and much safer for the patient,” he added.

Recognizing the need to improve physicians’ awareness and understanding of complex symptoms, in 1963 Bascom Palmer hosted the nation’s first clinical postgraduate educational session devoted to neuro-ophthalmology. “We invited patients with very intriguing conditions to join ophthalmologists and neurologists from around the country to attend the session on Miami Beach,” said Smith. “The annual Bascom Palmer Neuro-Ophthalmology Course rapidly became very popular and continued for more than 15 years. Unlike most medical conferences where presenters give a lecture illustrated with slides, we had actual ophthalmologic patients who could be examined by physicians taking the course. Our patients benefited by being able to get multiple opinions on their conditions.”

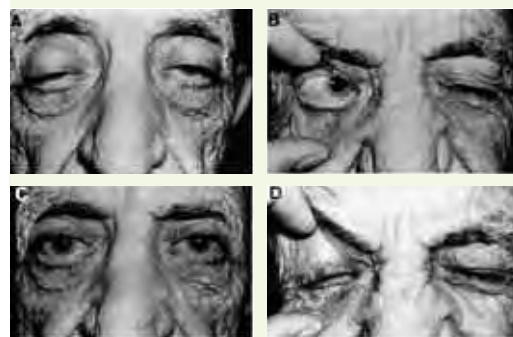
Medical education soon became a Bascom Palmer tradition, as Smith and Glaser each trained several fellows every year in the 1970s, ‘80s and ‘90s. In 1978, Smith launched the *Journal of Clinical Neuro-Ophthalmology* and during the same decade, Glaser wrote *Neuro-Ophthalmology*, a landmark textbook in the field now in its third edition. That tradition has continued with Schatz and Lam, and today more than 100 ophthalmic subspecialists around the world have received neuro-ophthalmology training at Bascom Palmer.

One of Smith’s early fellows was Schatz, who trained at Bascom Palmer in the 1960s and became one of the first neurologists to move into this new discipline. “I was the first one to make the jump,” Schatz recalled in a 2005 interview with the *Journal of Neuro-Ophthalmology*. “We would encounter diseases of the eye that would require us to really use our skills to come up with a diagnosis.”

Known for his “Borscht Belt” humor as well as his clinical acumen, Schatz has published articles on virtually every unusual phenomenon in the field of neuro-ophthalmology. Schatz was director of neuro-ophthalmology at Wills Eye Hospital in Philadelphia and came temporarily to Bascom Palmer in 1982 while Glaser was

Common neuro-ophthalmic conditions include:

- Optic neuritis from inflammations and infections
- Ischemic (vascular) optic neuropathy
- Optic nerve compression from brain problems
- Cerebrovascular disorders involving vision (strokes)
- Tumors involving the visual pathways in the orbit and brain
- Pituitary tumors
- Facial muscle disturbances including spasms
- Thyroid eye disease
- Myasthenia gravis
- Ocular motor disorders, such as cranial nerve palsies (double vision)
- Pupillary abnormalities
- Hereditary optic neuropathies
- Headaches and facial pain syndromes
- Multiple sclerosis
- Disorders of how we move our eyes and how we see our environment



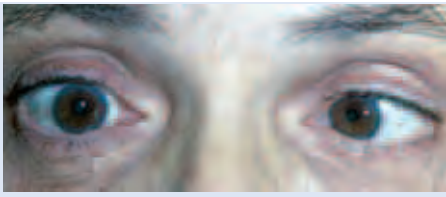
Ocular Myasthenia Gravis

Before treatment

- (A) Upper eyelid drooping on both eyes (bilateral ptosis)
- (B) Weakness of eye closure

After treatment

- (C) After injection of edrophonium, the ptosis is relieved
- (D) Lid muscles are strengthened



This patient has double vision due to right 6th nerve palsy. Poor abduction of the right eye means the right eye does not move to the right when looking toward the right.

The Pirate of P.S.98

As a youngster on Long Island, Father Bob Libby was hit in the face by a baseball, leaving him with a broken nose and a weak left eye. He became known as the “Pirate of P.S.98” for wearing an eye patch to school. Decades later, Libby was referred to Bascom Palmer to correct a macular condition.

Last year, Libby was conducting services and realized he needed more light to read the Bible – a symptom of cataracts.

“Not long afterwards, I started to have double vision,” said Libby. “I asked Dr. Schatz to casually look at my eyes since we are neighbors. He saw the bags under my eyes and other signs and immediately diagnosed Graves disease.”

I next saw him at Bascom Palmer and after further tests, he confirmed the diagnosis. Schatz recommended prism lenses along with medication to relieve the puffiness. “Since then, my condition has greatly improved,” said Libby. “I really appreciate the excellent care I received from the whole Bascom Palmer team.”

on sabbatical leave teaching at Hadassah Hospital in Jerusalem. Schatz became a faculty member at Bascom Palmer in 1986 and continues to be an adjunct professor in the department of neurology at the University of Pennsylvania School of Medicine. Through the years, he and Glaser maintained their friendship and after a time at Mercy Neuroscience Institute and in private practice in the mid-1990s, they rejoined Bascom Palmer’s faculty in 2001. “I am attached at the hip to Joel Glaser,” said Schatz. “Without his friendship and counsel, I would never have survived my medical career.”

Today, Bascom Palmer’s neuro-ophthalmologists continue to train the next generation of ophthalmologists and neurologists in their chosen field. “We make sure no resident leaves Bascom Palmer without at least a basic understanding of neuro-ophthalmology,” said Schatz. “When a new ophthalmologist goes into retina, glaucoma or other specialty, we want to be sure they are aware of the signs of trouble and when to make a referral to a neuro-ophthalmologist.”

“At the end of the day, these men and women who carry on the tradition of excellence in patient service, clinical research and enthusiastic teaching are the most important contribution of Bascom Palmer to worldwide neuro-ophthalmology,” said Glaser.

Advancing eye-brain research

While neuro-ophthalmology is primarily a clinical specialty, Bascom Palmer’s faculty members are actively involved in research; studying the interrelationship between the brain and eye. Using different types of MRI scans, for instance, they can track changes in the brain’s processing centers that are connected with visual disorders.

“Today, we are able to map out a patient’s visual field by stimulating areas of the brain and watching the response on a functional MRI scan,” said Schatz. “That helps take the subjective responses out of vision tests and make objective responses.”

Another major area of research involves abnormal eye movement patterns that relate to different brain disorders. One example is nystagmus, when the eye moves smoothly in one direction and then jumps back in the other direction. “Because there is a wide spectrum of causes for ‘jumpy eyes’ from strokes and ear disease to multiple sclerosis,” said Schatz, “we are studying brain activity to try to better understand these patterns.”

Other Bascom Palmer faculty members have their own areas of research interest. Glaser has studied medical and surgical treatments for optic nerve disease, while Lam has focused on genetics and retinal degenerations, as well as anterior ischemic optic neuropathy (AION), where damage to the optic nerve results in a loss of vision.

Pasol has found that vitamin supplements can help some patients with severe headaches and is using OCT technology to identify which patients with multiple sclerosis (MS) also develop optic neuritis. “We believe the thickness of the nerve layer may be an indicator of whether an MS case is progressing or not,” he said.

Summing up the Institute’s contributions to clinical care, medical education and research, Lam said, “Bascom Palmer offers an excellent environment for neuro-ophthalmology to thrive. We have a great clinical faculty in every field and we combine our areas of expertise on behalf of our patients. That’s what makes us strong – everyone here has a synergistic relationship with each other.” ■