

2014 SIGHT + SOUND

SPRING EDITION



HPV Vaccine is Cancer Prevention

By Katherine M. Troy

Initiated by George A. Fechter, Chairman of the Eye & Ear Foundation Board of Directors, a partnership was formed between the Eye & Ear Foundation and the Jewish Healthcare Foundation to raise public awareness of an HPV cancer vaccine. ***“It became apparent to us that children should be vaccinated. There is now an opportunity for an entire generation of people to avoid HPV-related cancer,”*** said Jonas T. Johnson, Chairman of the Department of Otolaryngology at the University of Pittsburgh’s School of Medicine. On February 7, 2014, the EEF and JHF, along with leading experts in the field, met to develop an outreach plan to encourage HPV vaccination. Through our HPV Vaccination Awareness Initiative, ***“We believe we will save lives and prevent suffering,”*** states Karen Wolk Feinstein, PhD, President and CEO of the Jewish Healthcare Foundation.

Human Papilloma virus (HPV) infection in the United States is widespread. Currently, approximately 79 million Americans are infected with HPV, with more than 14 million new infections annually, according to the Center for Disease Control (CDC). By age 50, during some point in their lives, at least 4 out of every 5 women will have been infected with HPV. Most people do not even realize they are infected until an abnormal test result, such as a pap smear, is received. Yet, in 2012, the HPV vaccination rate was only 33% for girls ages 13-17 and a dismal 6.8% for boys ages 13-17. The CDC began recommending the vaccine for boys in 2011 and for girls in 2006. Compare this to the chicken pox vaccine. In the early 1990s, before the chicken pox vaccination, there were 4 million chicken pox infections annually. By 2010, 90% of children had received one dose of the varicella vaccine, causing chicken pox incidence to decline by 82%. Unfortunately, the HPV infection continues to rise dramatically, so much so that federal health officials have named HPV as one of the top five health threats for 2014. ***“We found the data around cancers and other health conditions caused by the HPV virus disturbing, particularly because this is a health problem with a solution,”*** said Dr. Feinstein.

As explained by the National Cancer Institute, HPV consists of over 150 viruses. More than 40 of these viruses can easily spread through direct skin-to-skin contact, infecting the epithelial cells. Once an HPV enters an epithelial cell, the virus begins to make proteins. Two of these proteins interfere with normal functions in the cell, enabling the cell to grow in an uncontrolled manner and to avoid cell death. Many times these infected cells are recognized by the immune system and eliminated. Sometimes, however, these infected cells are not destroyed, and a persistent infection results. As the persistently infected cells continue to grow, they may develop mutations that promote even more cell growth, leading to the formation of a high-grade lesion and, ultimately, a tumor.

Virtually all cervical cancers are caused by HPV infections. In the United States, 6 million women are infected with HPV, of which 10,000 women develop cervical cancer, and 4,000 women in the United States will DIE from the cervical cancer; 300,000 women worldwide die of cervical cancer every year. These are staggering statistics and unconscionable when there is a vaccine available to prevent this.

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Pictured above: Dr. Jonas T. Johnson presenting at the HPV Vaccination Awareness Initiative, February 7, 2014.

Save the Date

Saturday, September 27, 2014

The Eye & Ear Foundation
of Pittsburgh
and

The University of Pittsburgh
Voice Center

invite you to

A Celebration of Voice

6:30 pm– 10:30 pm

Twentieth Century Club

Oakland, PA

Reception and Concert

Presented by
the Opera Theater of Pittsburgh

Sponsored by
Steinway Piano Galleries
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Emcee:
Nancy Snyderman, MD

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Mariann Cornetti

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Dueling Piano Performers
Karl Bailey and Drew Tepe
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\$200 Per Ticket
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please call 412-864-1300.

The Charles and Louella Snyder Laboratory for Retinal Regeneration

by Zack Butovich



Left: Charles and Louella Snyder cutting the ribbon on the new Charles and Louella Snyder Laboratory for Retinal Regeneration.

allowed for Dr. Nasonkin to find a way to slowly insert RGCs one cell at a time into damaged retina tissue, where promising results have already been demonstrated.

Other projects involve using epigenetic concepts to completely rebuild sections of the retina, using stem cells, as well as genetic tracking to determine prominent markers that may indicate a propensity for certain degenerative disorders. This may help influence preventative medical care and more individualized treatment plans for those already suffering diseases and disorders of the eye with greater rates of success.

The Charles and Louella Snyder Lab will work in tandem and as part of the Louis J. Fox Center for Vision Restoration by partnering with other tissue engineers, geneticists, and ophthalmic researchers in order to innovate within the fields of regenerative technology and medicine, to help find new treatments and cures for diseases and disorders of the eye. **S+S**

Headed by Dr. Igor O. Nasonkin, the Dr. E. Ronald Salvitti Chair for Ophthalmic Research, the Charles and Louella Snyder Laboratory for Retinal Regeneration was formed through the culmination of a series of generous contributions by Charles and Louella Snyder, and their family foundation. Dr. Nasonkin is a highly trained geneticist and regenerative medicine specialist, and his focus is on finding ways to rebuild retinal ganglion cells (RGCs), which help the light-sensitive tissue in the back of the eye (the retina) perceive light and translate it into electric signals to be sent along the optic nerve to the brain. Current progress has



The Snyder family with Joel S. Schuman, MD, Department of Ophthalmology Chairman at the University of Pittsburgh, outside the new Snyder Retinal Regeneration lab.



Hearing Loss and Cognitive Decline

by Jenifer Fruit, AuD and Catherine V. Palmer, PhD

Nearly 27 million adults over the age of 50 have clinically significant hearing loss but of those, only about 15% use a hearing aid. Typically regarded as a “normal” part of the aging process, hearing loss may have a larger impact on quality of life than previously thought. Hearing loss in the older adult encompasses much more than a need to raise the television volume or difficulties hearing children or grandchildren. Recent research across the fields of otolaryngology, gerontology, and audiology has concluded that undiagnosed and/or untreated hearing loss is an indicator for increased cognitive decline and increased diagnosis of dementia. The relationship of hearing loss to cognitive function is multifaceted. The inability to hear conversational speech and other sounds causes the brain to receive a degraded speech signal, thereby increasing the chance for structural changes in the brain to occur. A hearing loss which is not properly managed (through medical treatment, hearing aids or other assistive listening devices) will reduce the stimulation provided to the neural connections in the brain, thereby compounding the effect of the hearing loss. In terms of the part of the brain associated with hearing and speech comprehension, it appears to be a “use it or lose it” phenomenon.

In addition to the possible structural changes that may occur due to untreated hearing loss, there are also quality of life changes to consider. When an older adult begins to lose their hearing, social isolation can occur. A person with a decreased ability to hear or understand conversations may begin to avoid social situations to prevent feelings of embarrassment or frustration due to their hearing loss. Isolation can in turn lead to depression, loss of autonomy and anxiety.

Treating hearing loss also can improve the quality of life of an individual experiencing dementia and of the caregiver by allowing the individual to be more connected to the world around them. Research conducted at the University of

Pittsburgh found that individuals with dementia can successfully participate in hearing evaluation and can be successful users of hearing aids with assistance from their caregivers. Recent research at the University of Pittsburgh also has shown that untreated hearing loss can impact the diagnosis of dementia and its severity so health care providers will want to treat any hearing loss that exists in order to separate the impact of untreated hearing loss from underlying dementia.

The Center for Audiology and Hearing Aids at the Eye and Ear Institute and its satellite offices provide diagnostic testing, hearing aid and assistive device fittings and services to the greater Pittsburgh area. The data have never been more compelling to indicate that we need to treat hearing loss sooner rather than later in order to improve quality of life and maintain independence and social interactions that are so important to our cognitive health. 

Dr. Catherine Palmer is the Director of the UPMC Center for Audiology and Hearing Aids. Dr. Palmer specializes in rehabilitative audiology including the use of hearing aids and other assistive devices to improve communication for individuals with hearing loss, and hearing protection for specialized situations. Dr. Palmer also manages a research laboratory at the University of Pittsburgh where her research focuses on matching technology to individual needs and examining adaptation in the human auditory system. To support Dr. Palmer's research, donations can be made at eyeandear.org or through the attached envelope.

Dr. Jenifer Fruit is an audiologist within the UPMC Center for Audiology and Hearing Aids. Her special areas of interest include diagnostic testing and hearing aid fittings as well as special projects in clinical research.

Muse Prize Awarded

The Eye & Ear Foundation bestowed the 2013 Albert C. Muse Prize for Excellence in Otolaryngology to **Dr. Richard J. H. Smith**, Professor & Vice Chair, Professor & Vice Chair, Department of Otolaryngology Director, Iowa Institute of Human Genetics, University of Iowa College of Medicine.

The Muse Prize was established in 2001 to honor the world's leaders in the fields of Ophthalmology and Otolaryngology and recognizes individuals who have made significant, progressive contributions to the field of science and medicine within these two specialties. The award also honors Albert C. Muse for more than four decades of dedication and active service to the Eye and Ear Hospital and now subsequently the Foundation, and his personal support of research, knowledge, and treatment of the diseases affecting the eye, ear, now, throat, hand and neck.

Siciliano Lectureship Awarded

The Eye & Ear Foundation bestowed the 2013 Siciliano Lectureship to **Dr. Jonathan C. Irish**, Provincial Head, Surgical Oncology, Cancer Care Ontario, The Kevin and Sandra Sullivan Chair in Surgical Oncology, University of Toronto Chief, Department of Surgical Oncology, University Health Network, Mount Sinai Hospital Professor, Department of Otolaryngology, Head and Neck Surgery, University of Toronto.

The Siciliano Lectureship was established in 2005 by EEF board member, Huberta Siciliano, in memory of her husband, John, and made possible by the John Vincent and Huberta Schiappa Siciliano fund – dedicated to the advancement of new treatments and cures for head and neck cancer.



Life Changing Experience

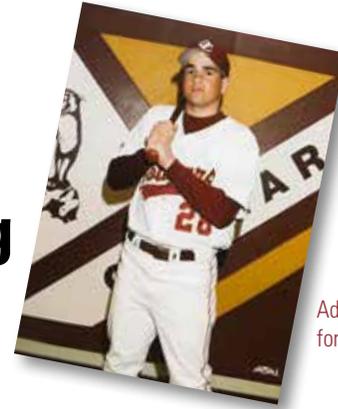
Adam Burdell has used this experience and turned it into a successful career in the healthcare industry. He is a Clinic Operations Supervisor for Children's National Health System in Washington, DC. Adam feels that, due to his health history, he can relate to the patients and families better than anyone else. His passion for healthcare has led him to pursue a Master's degree in Healthcare Administration from St. Joseph's University.

Still extremely grateful to Dr. Myers, Jody and Victor Burdell have initiated a planned gift to the Eye & Ear Foundation through their estate. This generous donation will be used to support the research within the University of Pittsburgh's Department of Otolaryngology.

Never Ending Gratitude

By Katherine M. Troy

Eugene N. Myers, MD, FACS, FRCS Edin (Hon) has enjoyed a successful 42 year career as an internationally known surgeon, researcher, and published author. He was Chairman of the Department of Otolaryngology at the University of Pittsburgh for 33 years. This June, while still continuing to write and travel, Dr. Myers will retire from his medical practice. Dr. Myers plans to continue his work on the Eye & Ear Foundation Board of Directors, being President of the Board of Directors of the Opera Theater, and a member of the Board of Directors of the Pittsburgh Athletic Association. He also will be the Director of the Myers Family Foundation which will support research in surgical innovation and the performing arts, two of Dr. Myers passions.



Adam at age 17. He played for a varsity baseball team.

Seven year old Adam Burdell loved playing baseball and was not about to let cancer stop him. While in the hospital, all he could think about was getting back out on the field. One night, he begged his father, Victor, to sneak him out of the hospital so he could play in his little league game. Chuckling, his dad told him he wasn't in the lineup that night, but would be back out there soon. Adam held on tight to that thought during his stay in Children's Hospital of Pittsburgh.



Adam at age 7.

That was May 1994, when repeated eye infections caused the Burdells to seek the advice of an Ophthalmologist. A clogged tear duct was suspected and outpatient surgery was scheduled to insert a tube to keep the duct open. While in surgery, a large tumor in the palate was discovered which was causing the tear duct to be obstructed. He was admitted to Children's Hospital that same day.

As days past, the Burdell's braced for the fight of their lives, as many physicians collaborated to determine the type of tumor and treatment

plan. Finally, the physicians determined Adam had a rare tumor originating in the salivary gland (usually seen in adults), which was destroying his palate. The tumor was locally aggressive, but slow growing, and had not spread. At this point, Jody and Victor Burdell were given little hope for a good long-term prognosis for their son. Surgery was the only option, however, after an exhaustive search, it was determined that the only surgeon who had the skills to perform this surgery was Dr. Eugene N. Myers, then Chairman of the Department of Otolaryngology at the University of Pittsburgh. On that same day, the Burdells were seen in Dr. Myers' office.

Dr. Myers said that "After examining Adam, reviewing his pathology report, which diagnosed a low-grade tumor with little chance of spreading and seeing his imaging studies, I felt confident that Adam had a potentially curable situation. According to Adam's mother, Jody, ["we will never forget those words as long as we live."] The surgery I proposed included removing one half of his palate (roof of the mouth) and placing a skin graft in the wound to cover the remaining tissues. In order for Adam to speak and swallow normally, our dental team made a special denture which clipped onto his remaining teeth."

Surgery was scheduled a few days later, but in the meantime, Jody and Victor took their son home for the weekend to see family

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Elusive Whole Eye Transplant An Audacious Program

By Zack Butovich

Transplanting the whole human eye is a goal as important as reaching the moon was for President Kennedy 50 years ago. Transplanting an eye successfully will require team science, just as teams were needed to build rockets to reach the moon. But what does that mean? It means that scientists, clinicians and engineers with extraordinary and special skills will need to come together to work on the problem of whole eye transplantation.

Whole eye transplant will present far more complex issues than more common organ and other tissue transplants, and will require the highest expertise across many disciplines in order to succeed in all the involved facets of the operation.

To that end, Dr. Joel S. Schuman, Director of the UPMC Eye Center and Chair of the Department of Ophthalmology at the University of Pittsburgh, has designed a way to resolve the inherent issues that consistently impeded progress in the past. Dr. Schuman has worked to establish a large, multi-disciplinary collaboration, combining several of the preeminent departments across the University of Pittsburgh and UPMC infrastructure with leading scientists from other world-class academic and research institutions.

Combining the world-class expertise of the Thomas E. Starzl Transplantation Institute at the University of Pittsburgh and noted surgeons Dr. Kia Washington and Dr. Vijay Gorantla, with the experts at the Louis J. Fox Center for Vision Restoration and Department of Ophthalmology at the University of Pittsburgh (including Dr. Schuman and the Ophthalmic Imaging Research Lab led by Dr. Gadi Wollstein), Dr. Schuman established a strong framework to lead the scientific efforts, which soon extended outwards, until it built upon new relationships with experts in optic nerve regeneration at Harvard University, led by Dr. Larry Benowitz, and retinal regeneration at the University of California in San Diego, led by Dr. Jeff Goldberg.

In order to begin to approach the huge challenges of eye transplantation we will need to assemble a group containing specialists in transplanting complex tissues, transplant immunology, molecular genetics, and optic nerve regeneration. It seems daunting to consider whole eye transplantation — and it should. No one has ever successfully transplanted the human eye and had it survive, much less gotten it to see.



The Whole Eye Transplant collaborators (left to right): Robert W. Nickells, PhD (UW); Victor L. Perez, MD (BPEI); Angus W. Thompson, PhD, DSc (Pitt); Larry I. Benowitz, PhD (Harvard); Joel S. Schuman, MD (Pitt); Kia M. Washington, MD (Pitt); Jeffrey L. Goldberg, MD, PhD (UCSD); John E. Dowling, PhD (Harvard); Dimitri Azar, MD, MBA (UIC); Alain Chedotal, PhD (Paris); Louis J. Fox, JD (EEF); Donald J. Zack, MD, PhD (Hopkins) *Not Pictured:* Andrew D. Huberman, PhD (UCSD); Ben A. Barres, MD, PhD (Stanford); Vijay S. Gorantla, MD, PhD (Pitt)

We believe, at the Fox Center for Vision Restoration of UPMC and the University of Pittsburgh, that setting a bold goal is critical to innovation and success in creating new and important discoveries, and to improving the care that we can offer to our patients.

We have already taken the first steps towards whole eye transplantation research. A team has been brought together from throughout the world, consisting of just the disciplines named above, in particular with expertise at the University of Pittsburgh in complex tissue allografting and transplant immunology. We are also including scientists at the University of Pittsburgh who study the development of the retina and regeneration of the optic nerve to begin to approach these problems. This is a collaborative work, with many universities throughout the world involved, but centered at the University of Pittsburgh, at the Fox Center for Vision Restoration.

The first step was whole eye transplant in rats from genetically identical animals, eliminating the challenge of immunologic rejection. This has already been done by researchers at the University of Pittsburgh. Eyes that have been so transplanted can survive for at least a month with healthy appearing retinal tissue, but loss of the optic nerve. Despite the fact that the circulation to the eye has been restored, and that the optic nerve has been reconnected between the transplanted eye and the host, the neurons in the optic nerve do not grow back. That is, they do not grow back under normal conditions. This is a tremendous problem that we are working on collaboratively with the Whole Eye Transplant team from around the world.

This type of collaboration is the perfect fit for the Louis J. Fox Center for Vision Restoration to take on, as it was designed to be a scaffold to a large, multi-disciplinary effort that a project such as whole eye transplant requires. "This is an audacious program," states Dr. Joel Schuman, "with very high risk and high reward scenarios. We're very excited to be leading the project, and very honored to have been collaborating with global leaders in optic nerve regeneration."

"In some ways, the whole concept sounds crazy," Dr. Schuman continues, "but by solving one facet of the problem at a time, this may be possible." The entire project has just started to form — creating this collaborative team was an enormous first step. The next step involves bringing in necessary funding to support the work, followed by establishing animal models and testing for preliminary results. The funding received a huge boost from Eye & Ear Foundation Board member, Louis J. Fox, who has been instrumental in promoting this project. It may take longer to develop the techniques and technologies necessary for whole eye transplantation than the decade President Kennedy set for reaching the moon, but the challenge and reward of whole eye transplantation are so much greater for mankind. **S+S**

Developing a working model for the transplant of an entire eye has been a goal for Dr. Schuman for many years. And now, thanks to the Fox Center and the initial support of a few generous donors, including Louis Fox, the project is beginning to form into a reality. Should you wish to offer your support to this audacious project, please contact the Eye & Ear Foundation, 412-864-1300, or direct a donation using the attached envelope.

Never Ending Gratitude

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and visit a museum to make up for a missed class field trip. Victor and Adam also went to a baseball game, which the family fondly refers to as Dad and Lad time. Adam was discharged on June 3rd, his 8th birthday! While celebrating that glorious day, the Burdells anxiously awaited the biopsy results. Five days later, Dr. Myers called to say "all margins are clear." That day, June 8, 1994, marks "the happiest day of our lives," Jody exclaimed!

To Jody, "Dr. Myers is not only a superior surgeon, but he also related so well to us and Adam." For a school assignment, Adam had written a letter to Dr. Myers, which summed everything up quite nicely. His letter simply stated, "thank you for saving my life." Needless to say, Adam received an "A" on his assignment. Adam too, still remembers Dr. Myers fondly. "Dr. Myers was amazing. His bedside manner was the best I have ever seen." Dr. Myers made such an impression on Adam, that to this day he misses waiting in his office for a follow-up appointment. Dr. Myers always opened his door with a big smile followed by, "it's the famous Mr. Adam. Do you have a new baseball picture for me?" Adam feels it's rare for a doctor to connect with the patient and family as well as Eugene Myers.

While the surgery could have been disfiguring, Adam has only a small scar hidden on the side of his nose to the upper lip. Adam recalls, "About a year ago, I had a plasticsurgeon approach me to ask if he could repair what he thought was a minor cleft lip. Once I explained what it actually was, I told him my scar is a testament to what I went through as a kid and I wear it proudly, like a gold medal."

Adam strongly believes, "I would not be where I am today without the support of my family, friends, and Dr. Myers." This June 8th will mark 20 years cancer free for Adam. He plans to celebrate with his best friends, and to "raise our glasses to the next 20 years." Cheers, Adam! **S+S**

Should any of Dr. Myers' friends and former patients wish to extend their well wishes, cards and notes can be mailed to: Dr. Eugene Myers, c/o Eye & Ear Foundation, 203 Lothrop Street, Suite 251 EEI, Pittsburgh, PA 15213.

Living With Eyes Wide Open

By Katherine M. Troy

Imagine slowly losing your eyesight... the numbers on your computer screen becoming increasingly difficult to distinguish, driving unto unseen curbs, to becoming completely blind at night. Your life filled with worry and fear on the prospect of being unable to work or care for your family. Such was the life of Bob Kurp.

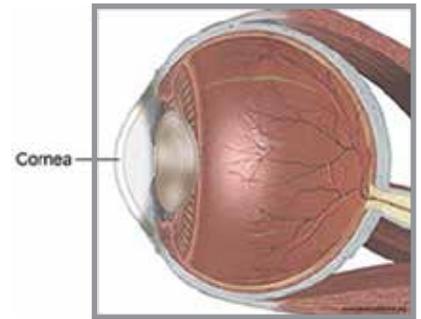
It was December 2011 when Bob began to notice his eyesight was getting progressively worse. He recognized the path he was about to go down. His grandmother, mother, and sister all suffer from the same disease, Fuchs' Dystrophy. Bob's fears were confirmed with a visit to his optometrist.

Fuchs' dystrophy affects the thin layer of endothelial cells that line the back of the cornea. These cells help pump excess fluid out of the cornea. As more and more cells are lost, fluid begins to build up in the cornea, causing it to swell and distort vision. Advanced disease can result in pain and severe visual impairment.

Being a CPA, Bob needed his eyesight to effectively perform his job, but even more importantly, he was the primary caregiver for his very ill daughter. Although it affected his quality of life, it would take Bob a few years before seeking a specialist. A friend's referral led him to Dr. Deepinder K. Dhaliwal, a renowned corneal surgeon at the University of Pittsburgh Medical Center.

Although Dr. Dhaliwal recommended corneal transplant surgery as soon as possible, and advised that he would regain his sight within several weeks to months, Bob hesitated. His primary concern was his daughter, and he worried about the amount of work he would miss during recovery.

By May 2012, Bob could no longer delay it. He experienced increased difficulty reading, using the computer, differentiating between numbers on spreadsheets, and driving after dark. After scheduling the surgery, Bob prayed, "Please fix it as if nothing had happened." The surgery was a success and recovery was much better than he had anticipated. Bob explained that "an air bubble is added to support the eye, as it gets reabsorbed, the better your vision becomes." Within four days, Bob could see perfectly!



In October 2012, he had a corneal transplant on his other eye. As they prepped Bob for surgery, he paused for one last look at what it was like to view a blurry world. He scanned the operating room with his bad eye, taking it all in, this "miraculous moment," when his eyesight would be completely restored. From the verge of blindness to 20/20 vision, Bob said, it was "a miracle I had prayed for, but I never fully expected to be so very blessed."

Most of his life, Bob wore thick glasses; today he no longer needs them. "It is like the world has opened up to me. I notice and appreciate everything," exclaims Bob!

He gave himself the nickname, Blind Bartimaeus. "I tell everyone that I was blind, but now I see. It went from really bad to really great." Bob now lives his life with his "eyes wide open." Two years later, he still awakes, with an appreciative prayer and awe. Bob has now made it his mission to help Dr. Dhaliwal by requesting support to the Eye & Ear Foundation for her research. Dr. Dhaliwal is investigating the use of an opaque gel to simplify the eye drop regimen for those suffering from degenerative eye diseases. The use of this gel would decrease the use to only one eye drop and at much longer intervals, around once a month or even longer, depending on the condition and the need. **S+S**

Deepinder K. Dhaliwal, MD, L.Ac is the Director of Cornea and Refractive Surgery Service, as well as the Director at the Center for Integrative Eye Care for UPMC and Associate Professor of Ophthalmology at the University of Pittsburgh. Dr. Dhaliwal has been a member of the Eye & Ear Foundation Board of Directors since 2010. The EEF fundraises to provide support for Dr. Dhaliwal's research. Should you wish to support our research, please use the envelope provided or visit eyeandear.org.

For an appointment with Dr. Dhaliwal, please call 412-647-2200.

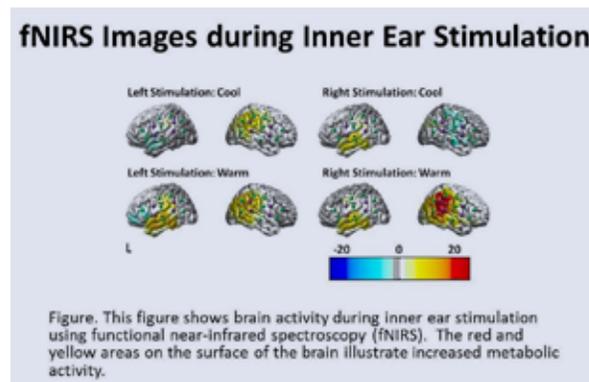
Advances in Balance Disorders Research

By Joseph Furman, MD, PhD

Many exciting new advances are being made in the area of balance disorders research. Balance disorders of the inner ear labyrinth can cause dizziness, disequilibrium and problems walking. In addition to these well-recognized symptoms, many persons with a balance disorder also have difficulty thinking clearly and paying attention, especially for long periods of time. This aspect of balance disorders has received relatively little interest even though problems with cognitive abilities can actually be more disruptive than problems with dizziness or disequilibrium. At this time, there are no recognized diagnostic tests or specific treatments designed to address difficulties with thinking or performing cognitive tasks in persons with balance disorders.

The Department of Otolaryngology at the University of Pittsburgh, in collaboration with the University's Department of Radiology, is adapting a cutting-edge brain imaging technology to the evaluation of persons with balance disorders. This new brain imaging technology is called functional near-infrared spectroscopy (fNIRS) and is actually based upon the same technology that has been used for many years to measure oxygen content in the blood. fNIRS brain images are comparable to CT and MRI scans in the sense that the diagnostic technique focuses on the brain. However, there are many unique features of fNIRS technology that

are especially attractive for the evaluation of persons with dizziness and disequilibrium. Unlike CT and MRI scans, which require persons to be perfectly still while reclining in a scanner, fNIRS brain images can be obtained from individuals who are standing, walking,



or even spinning in a diagnostic Barany chair. To produce an image using fNIRS, we developed a modified scuba-diving type cap that contains a fiber optic cable system that transmits room-temperature high intensity light to the surface of the head and simultaneously records light waves reflected from the surface of the brain. The amount and type of light waves that are reflected depend upon brain activity. The signals from the fiber optic cable are processed using sophisticated computer software to produce brain images such as the one shown in the figure above.

Researchers at the University of Pittsburgh have been especially successful in the early stages of applying fNIRS technology to the area of dizziness and disequilibrium because of a productive research collaboration between faculty members in the Division of Balance Disorders and Professor Theodore Huppert, a physicist in the Department of Radiology at the University of Pittsburgh. To date, we have used fNIRS technology at the Eye and Ear Institute to measure brain activity during standard laboratory balance tests in normal volunteers. Our initial findings have been extremely encouraging because we have confirmed that stimulation of the inner ear balance mechanism increases brain activity

in specific portions of the surface of the brain. These specific brain areas correspond to brain areas that are known to be important for balance and for thinking. We have found that the brain activity of older persons during inner ear stimulation is different from the brain activity of younger persons during the same stimulation. We also found when persons are attempting to maintain their balance while standing on a moving floor the balance areas of the brain are more active. Now that these preliminary research studies have been performed, we have begun to apply fNIRS technology to studying

the brain activity of persons with inner ear abnormalities. Our hope is by applying fNIRS to the assessment of persons with dizziness and disequilibrium; we will be able to develop new treatment strategies to specifically address the complaint of impaired thinking in persons with balance disorders. S+S

Dr. Joseph Furman is a professor of otolaryngology, neurology, bioengineering, and physical therapy at the University of Pittsburgh, and serves as director of the UPMC Center for Balance Disorders. To support Dr. Furman's research, donations can be made at eyeandear.org or through the attached envelope.

HPV Vaccine is Cancer Prevention

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HPV infections have been found to cause cancer of the oropharynx, which is the middle part of the throat including the soft palate, the base of the tongue, and the tonsils. In the United States, more than half of the cancers diagnosed in the oropharynx are linked to HPV. It is estimated that, by 2020, HPV will cause more oropharyngeal cancers than cervical cancers in the United States.

With the HPV vaccination rates stagnating, it leaves an entire generation susceptible to HPV-related cancers. "Progress toward HPV vaccination has stalled, risking the health of the next generation. Doctors need to step up their efforts by talking to parents about the importance of HPV vaccine just as they do other vaccines and ensure it's given at every opportunity," according to Tom Frieden, MD, MPH, Director of the Centers for Disease Control and Prevention.

Help us lower the risk of cancer, by having your child vaccinated against HPV. The current HPV vaccine only prevents the onset of the infection. It does not cure HPV once the patient is infected. According to Dr. Johnson, "This explains why it is essential for children to receive the vaccine before they are exposed to the virus." Currently, scientists in the Department of Otolaryngology are working to develop such a vaccine for adults. Should you wish to help fund this research, donations can be made to the Eye & Ear Foundation through the website or attached envelope. S+S

**UPMC Eye Center
(412) 647-2200**

**University Ear, Nose &
Throat Specialists of UPMC
(412) 647-2100**

If you no longer wish to receive our newsletter, please submit requests to our mailing address, or email optout@eyeandear.org

The official registration and financial information of the Eye & Ear Foundation may be obtained from the Pennsylvania Department of State by calling toll free, within Pennsylvania, **1-800-732-0999**. Registration does not imply endorsement.

eyeandear.org

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Eye & Ear Big Hit at Pitt's Winter Academy

By Lawton Snyder

In February 2014, Dr. Jonas Johnson, Dr. Joel Schuman, Dr. Catherine Palmer, and Dr. Clark Rosen were invited to present at the ninth annual Winter Academy in Naples, Florida. The Winter Academy is hosted by Dr. Arthur Levine, the Vice Chancellor of Health Sciences at the University of Pittsburgh, and is a one-day seminar open to the Pittsburgh community living in Naples during the winter months. This year was the first year Eye & Ear topics took center stage, and, to no surprise, there was a record 480 people in attendance.

As our supporter, you already realize the the importance of our research; however, many people in attendance that day were learning of it for the first time. After Dr. Johnson presented on the relationship of HPV to cancers of the head and neck, many people in the room were contacting their children to make sure their grandchildren were getting the HPV vaccine. When Dr. Schuman shared the results of some of the work taking place in the Louis J. Fox Center for Vision Restoration, people were amazed we had this kind of cutting edge science happening in Pittsburgh. When Dr. Palmer discussed the relationship of hearing loss to dementia, many people were setting up appointments to have their hearing checked. When Dr. Rosen ended the session by presenting the advances in voice treatment and voice therapy taking place in Pittsburgh, people realized how important the voice is to teachers, lawyers, business men and women, as well as to professional vocalists.

As you have learned from past *Sight + Sound* newsletters or in public forums with our presenting faculty, we are hard at work in Pittsburgh improving the quality of life for everyone. It is our aim at the Eye & Ear Foundation to support research and the educational efforts for our Ophthalmology and Otolaryngology Departments.

Thank you for your support!



Jonas T. Johnson, MD, FACS



Joel S. Schuman, MD, FACS