

# USING THE DAVINCI CODE

BY UMAMAHESWAR DUVVURI, MD

Minimally invasive approaches have become more common in many medical fields and ear, nose and throat disorders are no exception to the growing trend of minimally invasive surgery. One form of minimally invasive surgery is robotic-assisted surgery (also called robotic surgery). The first surgical robot was introduced in 1985. Since then, robotic technology has been developed and actively promoted by Intuitive Surgical, developers of the daVinci, the only FDA-approved surgical robot. This robot allows a surgeon better visualization of and access to small anatomic areas, and minimizes a surgeon's physiologic tremors.



The daVinci Surgical System is made up of three components: a console, a high-definition 3-D vision system, and a patient-side robotic cart with four arms which the surgeon manipulates in the operative area through ports. Articulating surgical instruments are mounted onto three of the robotic arms. The surgeon's hand movements are scaled and filtered to eliminate hand tremor and then translated into micro-movements of the instruments. Because the robotic arms are "wristed" to hold the surgical instruments, the surgeon can manipulate them in ways that could not otherwise be accomplished. The fourth arm controls the camera which transmits a true 3-D picture to the surgeon's console.

At University Ear, Nose & Throat Specialists of UPMC, we use the daVinci surgical robot to perform operations of the tonsils and the base-of-tongue, as well as other head and neck areas. These anatomic regions are very difficult to reach using conventional methods. Such surgeries are associated with prolonged hospital stays and generally require patients to undergo a tracheotomy. With the use of robot-assisted surgery though, we can now access these areas through the mouth, with excellent visualization and surgical exposure.

Many cancerous and non-cancerous conditions can be treated with these methods. Recently, we have employed robotic technology to remove excessive tissue from the base-of-tongue

for patients with severe obstructive sleep apnea (OSA). Preliminary results demonstrate that this is a safe and feasible procedure with minimal patient discomfort (all patients have left the hospital within 1-2 days, tolerating an oral diet). Some patients have experienced relief of symptoms and improvement of their sleep disturbance scores.

In the near future, we will offer robotic-assisted surgery for thyroid removal in patients with thyroid disorders. Surgeons will be able to assess a patient's thyroid gland (which is in the middle of the neck) through an incision in the armpit. This method has recently received FDA approval as a safe alternative to traditional thyroidectomy.



*The daVinci robot helps Dr. Uma Duvvuri perform intricate surgeries on hard to reach places for ear, nose and throat patients.*

Our initial experiences with robotic-assisted surgery of the head and neck suggest that this method reduces patient discomfort and promotes early post-procedure discharge from the hospital. We are committed to continuing advancements in this exciting approach to care, offering patients an alternative to traditional open surgery.

To support this and other important programs at The Eye & Ear Institute, consider giving through the Eye & Ear Foundation. Call 412-383-8756 or email [info@eyeandear.org](mailto:info@eyeandear.org) for more information. Or give online today via our secure Website, [www.eyeandear.org](http://www.eyeandear.org).

## SOFFER MEMORIAL LECTURE

Macular degeneration is a devastating disease that leads to blindness in many individuals. Joseph Soffer was affected with this life-altering condition. He was blind for the last four years of his life as a result of complications of macular degeneration. However, his wife, Vi, believes that with proper

education, others will not have to suffer the same fate. With a contribution to the Eye & Ear Foundation of Pittsburgh, Mrs. Soffer sponsored the first Joseph Soffer Memorial Lecture in Ophthalmology – an exclusive opportunity for donors, patients and friends to meet and converse with

experts in the Department of Ophthalmology and the UPMC Eye Center about our exciting initiatives and research. Joel S. Schuman, MD, FACS gave the inaugural lecture. For more information, please email [eyecenter@upmc.edu](mailto:eyecenter@upmc.edu).

[www.eyeandear.org](http://www.eyeandear.org)

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### *Vision of Hope continued from page 1*

studies and also helped create a large AMD database containing images and key clinical information. Recent assessment of these data

at UPMC Eye Center has led to several important discoveries. The first is that visual acuity often decreases well before wet macular degeneration occurs, thus acting as a biological signal indicating that an event is imminent. Our studies also indicate that previous traditional interpretations of risk factors for late AMD can be erroneous and misleading.

Though progression from the dry to wet form of AMD is typically slow (if it occurs at all), early detection is critical. Dr. Friberg's work has revealed effective, efficient ways to monitor macular degeneration to better predict which eyes have the highest risk of visual loss. Consequently, we can counsel individuals more appropriately.

As newer therapeutic and rehabilitative approaches evolve, Dr. Friberg emphasizes that a diagnosis of age-related macular degeneration does not mean that a patient will go blind, but



**Thomas Friberg, MD** delivering medication to the eye on a long-term basis via slow-release drug delivery will be important. This approach should reduce the treatment burden for the patient and their families, and is a primary focus of his research efforts in the Retina Service at UPMC Eye Center. Dr. Friberg believes that, "While persons suffering from age related macular degeneration are now much less likely to lose vision than they were just five years ago, AMD remains the major cause of blindness for adults living in America. In my opinion, only carefully-conducted and well-supported research will provide the answers needed for us to conquer this disease."

*Pivotal investigations like Dr. Friberg's require intensive labor and considerable resources. However, seed funding from the Eye & Ear Foundation supports the kind of studies that foster discovery. Your charitable gifts make a difference. Give today.*

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Summer 2010

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Following the presentation, facilities tours are available.

## DR. THOMAS FRIBERG: VISION OF HOPE

BY THOMAS R. FRIBERG, MD AND LAUREN WALLY

Thomas R. Friberg, Professor of Ophthalmology and Bioengineering, and Director, Medical and Surgical Retinal Diseases, has been on the faculty of the University of Pittsburgh for twenty-five years. During that time, he has been a clinical investigator and Study Director in many different

research studies and trials. One of his passions is gaining understanding of all aspects of diagnosis and treatment of macular degeneration (AMD).

Wet macular degeneration is characterized by neovascularization, or the growth of new, abnormal blood vessels. Left untreated, these vessels leak fluid and result in bleeding, visual loss, and scarring. Lasers were historically used to eradicate the new vessels, but in many cases, such treatment created a scar as well as a sudden, often irreversible decrease in visual acuity (clarity), so vision-sparing treatments were sought. One such method was photodynamic therapy, which preferentially targeted the new vessels with less damage to the surrounding tissue. This treatment, which involved the intravenous injection of a photosensitizing dye, was somewhat helpful, but often failed to increase visual acuity.

Recently though, physician-scientists like Dr. Friberg have embraced revolutionary treatments using drugs which target the new vessels directly.

These drugs are so powerful that if given intravenously, patients would suffer many undesirable side effects, making such administration impractical. Instead, a small dose of medication is injected into the eye itself, a procedure that is actually quite pain free. When treatments are administered early and frequently, visual clarity

can often be salvaged or improved. However, if these treatments are not initiated until after the damage has begun, the prognosis is not as favorable.



*Researchers like Dr. Thomas Friberg work to improve quality of care and quality of life for patients with macular degeneration.*

Over the last eighteen years, the UPMC Eye Center has been intrinsically involved in macular degeneration research, including two pivotal studies. Dr. Friberg directed the Prophylactic

Treatment of Age-related Macular Degeneration study (PTAMD) which used a mild laser strategy to change a primary feature of macular degeneration – drusen, or yellow deposits in the eye. This method was only mildly successful. However, he was also a Principal Investigator of the landmark Age-Related Eye Disease Study (AREDS) which established vitamins and mineral supplements as standard of care for preventing visual loss and slowing the progression of dry AMD.

Dr. Friberg's research has involved numerous volunteers followed over many years. Their contributions were invaluable to the individual

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DEPARTMENT OF OTOLARYNGOLOGY



Surgeons have long searched for techniques to make even the most major operations minimally invasive. Once upon a time, they dreamed that it might be possible to use robots to perform procedures where human hands could not go, using small telescopes and a vast array of tiny instruments, all manipulated through very small incisions. The advantage of such robotic surgery is the potential to accomplish major procedures

with even less collateral damage to the patient. In this edition of *Sight + Sound*, Dr. Uma Duvvuri describes his preliminary work that makes this dream a reality for patients. He employs a robot to operate on the back of the throat, an extremely difficult area to reach with one's hands, and uses robots to treat obstructive sleep apnea as well as for cancer surgery. These techniques are considered investigational today; however, I predict they will be widely embraced as state-of-the-art treatment in the not too distant future.

Also in this issue, we discuss Dr. Carey Balaban and his work as Director of the Pitt Center for the Biology of Vibration and Shock Exposure. Scientists have discovered that mild trauma to the brain may result in lasting injury. Dr. Balaban and his colleagues are studying the mechanism of injuries which come from direct blows like an athletic injury, or those which result from vibrations such as explosions. We are optimistic that new insight from these studies will result in effective treatment of these injuries, and even strategies to prevent them in the first place.

The challenge at University Ear, Nose & Throat Specialists of UPMC is to provide state-of-the-art care for patients today as we make great investment in research toward a better tomorrow – we are proud to continually rise to meet that challenge. Private philanthropy offers us the kind of aid that is essential for support of new ideas that could not otherwise be properly investigated. People like you make a difference – thank you.



**Jonas T. Johnson, MD**  
The Dr. Eugene N. Myers Professor and  
Chair in Otolaryngology  
University of Pittsburgh School of Medicine  
Eye & Ear Foundation Chair, The Eye & Ear Institute

DEPARTMENT OF OPHTHALMOLOGY



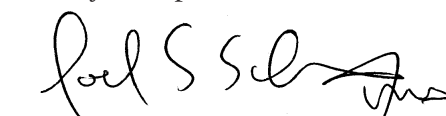
Age related macular degeneration (AMD) is a disease that affects adults over the age of 50, resulting in loss of vision. AMD can make it difficult or impossible to read, recognize faces, and drive – critically impacting a person's daily life. In the past, many people went blind from this disease because proper treatments were not available. Today though, we can preserve and even improve vision in many eyes with certain types of

AMD. The UPMC Eye Center has been involved in many studies of AMD over the past few decades. Dr. Thomas Friberg, a faculty member for the past twenty-five years, has been intricately involved with a number of research studies and trials, both as a clinical investigator and study director. Together with Drs. Andrew Eller, Denise Gallagher and Alexander Anetakis, he has pushed the envelope in analyzing and diagnosing the symptoms and effects of this disease, bringing hope to those afflicted by age related macular degeneration.

Mrs. Vi Soffer has seen firsthand how this disease can affect a person's lifestyle and quality of life. Her husband Joseph suffered with AMD for many years, finally going blind as a result. Mrs. Soffer believes that research and education are needed to help eradicate blindness as a result of having AMD. She has generously donated to the Ear & Eye Foundation so that a lecture can be given to the community to educate all in attendance about the devastating effects of this disease as well as discuss what can be done to stop it.

We are fortunate to have donors like Mrs. Soffer who understand that we need their help to accomplish great things in research, education and care at the UPMC Eye Center. With her support and the support of others, we can continue to provide world-class service to our patients while looking for treatments and cures for those diseases which can affect each and every one of us.

Won't you help?



**Joel S. Schuman, MD, FACS**  
Eye & Ear Foundation Professor and  
Chairman of Ophthalmology  
University of Pittsburgh School of Medicine  
Director, UPMC Eye Center, The Eye and Ear Institute

INVISIBLE HARM

BY ERVIN DYER

The Marine is on patrol not far from his base, under Iraq's blistering sun. Without warning, an improvised bomb detonates nearby. The blast instantly spawns a tsunami of vibration, a wave of pressure that spins outward at speeds greater than 1,000 mph. Moving faster than sound, the vibrations slam into the tank.

By the time he hears the explosion, the Marine has already been shoved against the innards of the tank. The armor of the tank seems to have shielded him from serious physical wounds. He tells his fellow soldiers he's OK. Or so he thinks.

The battered Marine does not realize that there's a problem until a few months later, after his return home. He begins to experience constant dizziness, nausea, memory loss, and ringing in his ears.

Thousands of service members come home with blast-related injuries similar to those experienced by the Marine. What researchers have discovered is that such violent vibration can shatter someone's very core: damaging hearing, bruising blood vessels, thrashing neurons, and traumatizing the brain. Now, an unusual area of research holds promise for these soldiers and for the rest of us, too. Carey D. Balaban, Professor of Otolaryngology at the University of Pittsburgh and Director of the Center for the Biology of Vibration and Shock Exposure, is dedicated to research into harmful vibrations.

Balaban is an expert on matters of balance. He knows that the inner ear, parts of the brain, and other sensory organs absorb vibrations, using them to help the body navigate, move through space, communicate, and react to threats. Vibrations are frequencies or movements of energy and pressure that flow from natural or mechanical sources and are emitted by all kinds of things. A "blast exposure" is any incident in which individuals feel or are exposed to a pressure wave before they hear a noise. Such exposure is regarded as a primary cause of much of the brain injury seen in soldiers.

Dr. Balaban's collaborative research with Navy Captain Michael Hoffer, of the Naval Medical Center San Diego, has shed light on how vibration is amplified in the body. Extended or violent vibrations against the thorax, sinuses, and intracranial cavity can injure soft tissues and eventually cause cellular injury or death of brain cells. Also, the loss of sensory neuronal cells, like those in the ears, can cause problems with hearing, equilibrium, migraine, and other health issues.

Researchers in this field contend that trauma from harmful vibrations is just as serious as concussion injuries. The latest studies have focused on 113 Marines who suffered blast injuries while in Western Iraq. The findings suggest that



*Soldiers subjected to blast exposure can suffer hearing loss, balance problems, and damage to brain cells.*

mild traumatic brain injuries can lead to migraine headaches, short-term memory loss, mental processing difficulty, or dizziness, which disrupts an individual's balance.

In the mid-to-late 1980s, two of Balaban's colleagues at the University of Pittsburgh, Drs. Rolf Jacob and Joseph Furman, recognized that many patients suffering from panic disorder with agoraphobia also evidenced a previously undiagnosed balance disorder, and vice versa. Their further studies suggested that some migraine patients also shared many of the same characteristics. For nearly 20 years, Dr. Balaban's NIH-supported work has focused on basic neurological explanations for these phenomena.

Extreme examples of harmful vibrations typically originate outside our bodies. But even weak supersonic pressure waves that radiate from a blast can rattle the body with such ferocity that they severely damage fragile tissues. In acute mild traumatic brain injury after blast exposure, Balaban and Hoffer recognized familiar culprits: combined dizziness and headache that were very reminiscent of the balance disorder-migraine-anxiety disorder phenomena. The severity varied, but the fundamental nature of the biological disruption was similar whether generated by the vibrations of a roadside bomb or those associated with a comorbid chronic balance and anxiety disorder. Their collaborative studies are translating basic and clinical research into better outcomes for our wounded warriors.



*Carey Balaban, PhD*

EXCERPTED FROM PITT MAGAZINE, SUMMER 2009 ISSUE

EYE & EAR PHYSICIANS ARE "TOP DOCS"

In the 2010 "Top Doctors" survey published by Pittsburgh magazine, Eye & Ear Foundation affiliated physicians have been named in both Ophthalmology and Otolaryngology.

The list was compiled by Castle Connolly Medical Ltd., a physician-led research team that scrutinizes a doctor's medical education, training, and experience. The result is a rigorously screened selection of highly ranked doctors on national and regional levels.

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Joel S. Schuman, MD, FACS

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For appointments, call UPMC Eye Center at 412-647-2200; University Ear, Nose & Throat Specialists of UPMC at 412-647-2100; or the Pediatric Otolaryngology division of Children's Hospital of Pittsburgh of UPMC at 412-692-5460.

Your continued, generous support of our scientists and physicians will ultimately enhance patient care for years to come. To give today, visit our secure Website, [www.eyeeandear.org](http://www.eyeeandear.org).



A VISION THAT CONTINUES TO INSPIRE

His life's work inspired a new visual landscape for the Pittsburgh region, with iconic real estate developments such as Penn Center East and West, and SouthSide Works, creating new ways for Pittsburghers to live, work and shop. So it was a cruel irony that in the later years of his life, Joseph Soffer, founder of Soffer Organization, lost his eyesight to glaucoma and macular degeneration, a leading cause of vision loss in Americans 60 years of age and older. Yet he continued to go to work every day, with no special assistance, until his death in 2006 at age 93.

Mr. Soffer's widow, Violet (Vi), has carried on his legacy in more ways than one. She arrives at her office in the SouthSide Works complex every weekday, to run what is a multi-million dollar real estate operation. With a warm heart and a full schedule of family, business, leisure and philanthropic endeavors, Vi Soffer's life is rich with purpose and activity. But she has chosen to extend it even more so that others might avoid the same fate as her husband's in losing the precious gift of sight.

"My husband's loss of sight could have been prevented, if it had been detected early enough," Mrs. Soffer said. "People need to understand that there is help available and research in the works right here in Pittsburgh that will do even more." Mr. Soffer had been seeing an ophthalmologist in New York and was told by him that the best care available was in Pittsburgh at UPMC with Joel Schuman, MD, FACS, Director of the UPMC Eye Center, and Chairman of the Ophthalmology Department at The Eye & Ear Institute.

In 2007, Mrs. Soffer began supporting the research and clinical work of the Eye & Ear Foundation through a financial commitment that includes underwriting the Joseph Soffer Memorial Lecture series, the first of which was held in May at the Southside Works Cinema. Combining a medical presentation by Dr. Schuman on macular degeneration and glau



*EEF Executive Director Lawton Snyder with new board member Vi Soffer at the first Joseph Soffer Memorial Lecture.*

coma, with a cocktail reception, the intent is to reach out to the community to educate about these diseases and garner support for the world-class research conducted at The Eye & Ear Institute, much of which is not covered by federal research dollars.

"I think it's important to give back to the community," she says. "In supporting the Eye & Ear Foundation, there is an opportunity to help people realize they can preserve their vision and to know that we have breakthrough research and medical expertise here that is among the best in the world."

In addition, Mrs. Soffer is now a member of the board of directors of the Eye & Ear Foundation, lending her considerable business expertise and insights to help guide its future.