

NEWS AND NOTES

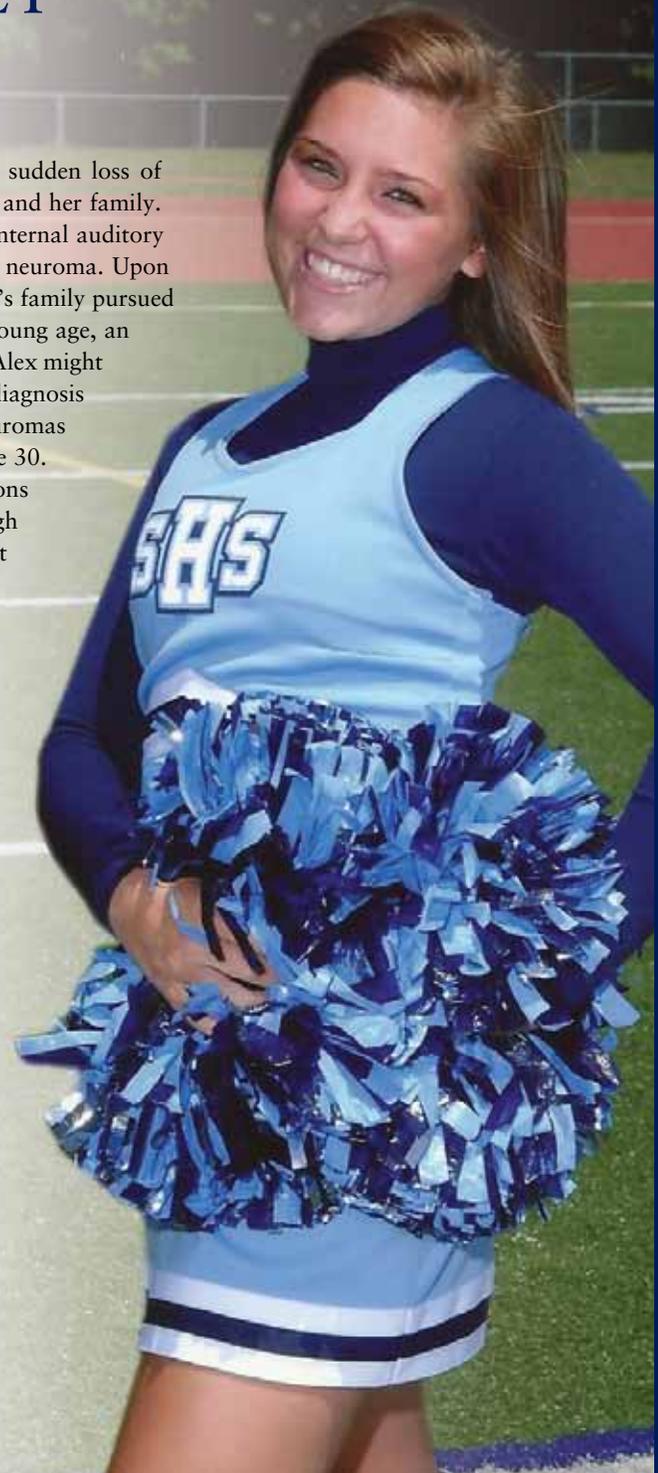
ISSUE 2 FALL 2010

FRIGHTENING JOURNEY ENDS WITH A CHEER!

When 13-year-old Alexandra (“Alex”) experienced headaches and a sudden loss of hearing in her right ear, a frightening roller coaster ride began for her and her family. An outside MRI was performed, suggesting that the tumor in Alex’s internal auditory canal was a vestibular schwannoma, otherwise known as an acoustic neuroma. Upon the recommendation of a friend treated for an acoustic neuroma, Alex’s family pursued treatment with Dr. Alexander Arts in Otolaryngology. Given Alex’s young age, an acoustic neuroma would be unusual, and Dr. Arts was concerned that Alex might have the genetic disease neurofibromatosis type 2 (NF2)—a terrifying diagnosis to receive. Patients with this condition typically develop acoustic neuromas in both ears, loss of balance, early cataracts, and loss of hearing by age 30. Dr. Arts carefully explained this diagnosis and its potential complications to Alex and her family, and recommended genetic testing. And although DNA testing proved negative for NF2, he suspected that Alex might have a new mutation of the NF2 gene, and be the first individual affected in her family. Because of her age, the relatively small size of her lesion, and the importance of trying to preserve her hearing, Dr. Arts recommended resection of the tumor, rather than the more conservative approaches of observation or radiation.

Interestingly, the biopsy of Alexandra’s tumor showed neither NF2 nor an acoustic neuroma. Rather, her pathology confirmed a rare and benign blood vessel tumor—an angioleiomyoma. Only two other angioleiomyomas in the auditory canal have been reported in the literature. Alex’s tumor involved the entire vestibulocochlear nerve, which had to be resected. Since her surgery, Alex has completely regained her balance and facial nerve function, and is not troubled by her unilateral hearing loss. In fact, according to her mother, “Alex is still on the cheerleading team, doing backflips and walkovers.” She adds, “We are so grateful, and amazed at the care [Alex] received. From the initial session, we knew that [we had] . . . the right doctors and the right hospital to take care of our daughter and the situation she was facing.”

Note: An article about this case, “Angioleiomyoma of the Internal Auditory Canal: Clinical and Radiographic Features,” was recently published in Otol Neurotol 2010; Sep 10. PMID #20838354.



Message from the Chair



I am delighted to again provide news of our department to our many alumni, friends, and supporters. Thanks to our exceptional team of faculty and clinical and support staff, our collective and collaborative work has culminated in many accomplishments. Once again, Otolaryngology-Head and Neck Surgery received the highest ranking among the specialty departments in the UMHS, and I am also proud to report that we ranked ninth in the annual *U.S.*

News & World Report listing of Best Hospitals. In addition, our Center for Facial Cosmetic Surgery (CFCS) and Vocal Health Center were in the top 10 care units in the U-M Health System in terms of patient satisfaction.

It has been a year of growth and expansion as well. The Livonia Center for Multispecialty Care now includes the Center for Facial Cosmetic Surgery (CFCS), the Michigan Sinus Center, the Vocal Health Center, and Michigan Hearing. As these satellite services have grown, so has our faculty. We are pleased that Drs. Vasu Divi, Scott McLean, Jeffrey Stanley, and Mark Zacharek have joined our clinical faculty. (You can read more about them later in this issue.) It has also been a year of celebration, with the October commemoration of both the Kresge Hearing Research Institute 50th anniversary and the 28th annual meeting of the Michigan Work Society. And how warmly gratifying it was to reconnect with so many alumni and friends of the department at the annual reception at the AAO-HNS fall meetings in Boston!

I continue to be both humbled and honored by the commitment and dedication shown daily in our work, and by the remarkable things that we are able to accomplish together. A grateful patient recently shared this sentiment with me: "You and the whole Oto team are amazing in the work that you do, and you do it all with character, respect, integrity, humility, and kindness." This is exactly what we are here to accomplish—I could not possibly have said it any better.

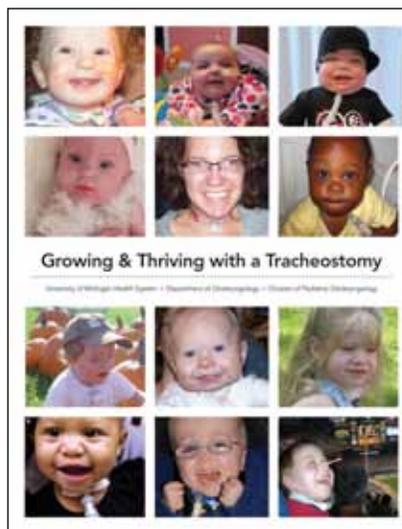
Warm regards,

Carol R. Bradford, MD
Professor and Chair

New Gene for Auditory Neuropathy Identified

The research team of Division Chief Marci Lesperance and Professor Margit Burmeister (Psychiatry and Human Genetics) has identified a gene mutation that causes auditory neuropathy—a rare form of hearing loss. A mutation in the gene *DIAPH3* was found to cause an overproduction of diaphanous protein, which leads to significant reduction in the hearing of fruit flies.

The team collected DNA from a family in which several members developed hearing loss during their teenage years. The hearing loss progressed to profound bilateral deafness, for which several family members were successfully treated with cochlear implants. Combining genetic inheritance information with biological function studies enabled the team to make this significant identification. "Since we knew of only two genes associated with auditory neuropathy, finding this gene mutation is significant," says Dr. Lesperance. "This discovery will be useful not only for this family, but for all patients with auditory neuropathy." Marc Thorne, MD, a former oto resident, is a co-author on the paper. Dr. Lesperance and her colleagues are currently recruiting research subjects for their studies aimed at identifying other genes involved in genetic hearing loss. For more information, see www.umclinicalstudies.org/ and *Proc Natl Acad Sci U S A.* 2010 Jul 27; 107(30): 13396–401. PMID: 20624953.



In other pediatric otolaryngology news, nurse practitioner Kristi Vander Hyde took on the herculean task of re-creating our tracheostomy teaching manual, *Growing & Thriving with a Tracheostomy*. This comprehensive 130-page manual is a tremendous help to patients and their families, as well as to health-care students. Other hospitals have ordered copies for their own programs, highlighting our expertise here at U-M.

Finally, Dr. Glenn Green has helped pioneer what is a life-changing experience for some of his pediatric patients. He and his surgical team developed a procedure called cricotracheal resection with hilar release, where damaged sections of the airway are removed and the lower trachea is moved up to connect it to the voice box. This enables removal of the tracheotomy tube and allows children to breathe and talk normally. So far, this procedure has been 100 percent successful! To learn more, see *Arch Otolaryngol Head Neck Surg.* 2010 Mar; 136 (3): 256–59. PMID: 20231643.

Cochlear Implant Program



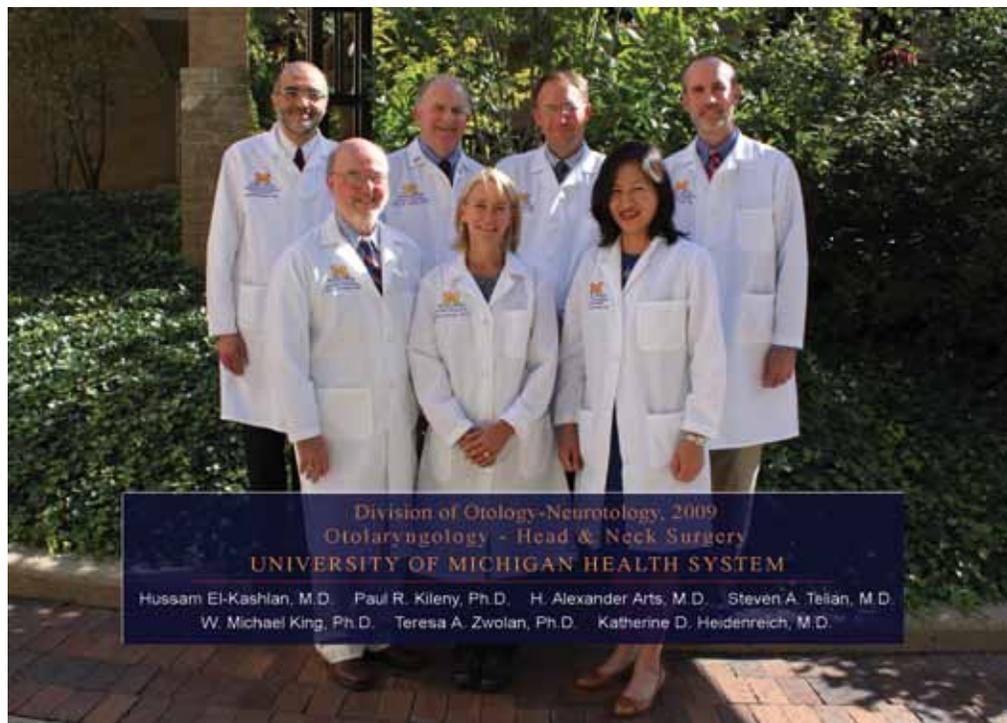
In the outreach arena, our Sound Support Program hosted several events to help professionals, parents, and patients understand the management needs of children with hearing loss. In June, we hosted the second annual Teen Event at Ann Arbor's acclaimed Neutral Zone. For both teenagers with cochlear implants and their parents, the focus of the event was "Getting Ready for Life after High School." Participants received instruction and hands-on training for self-advocacy and the use of assistive listening devices (such as "Shake Awake" bed alarms), learned about aids for improving performance in the classroom, and received a demonstration of CART (Computer Assisted Real Time Captioning) and C-Print (a speech-to-text system). The teen event was timely, as many participants were planning to attend college. Additionally, we hosted workshops for parents of young children with implants so they can meet, network, and learn from one another. We held events for toddlers at the Urban Toddler Learning Center in Saline, and at Gymboree in Roseville and we will sponsor a workshop for "tweens" on improving life skills later this fall at the Friendship Circle in Farmington.

This year the Cochlear Implant Program celebrates 25 years of providing state-of-the-art care to adults and children with severe to profound hearing loss. To date, we have performed more than 2,000 cochlear implant surgeries. Always striving to remain in the forefront of research and clinical care, we are now performing bilateral cochlear implants. Our patients report that using two devices instead of one results in their experiencing "stereo" rather than "mono" hearing, a greater ability to localize sound, and improved hearing in the presence of background noise. We are also participating in the multi-center Childhood Development After Cochlear Implantation (CDACI; John Niparko, PI) study to identify factors that impact language learning and development, auditory performance, and psychosocial functioning. An article was recently published in *JAMA* (2010 Apr 21; 303(15): 1498–506. PMID: 20407059) about the study, showing that children demonstrate greater improvements in spoken language skills if they receive the implant prior to three years of age. In addition, cochlear implantation at a younger age was associated with significant increases in comprehension and expression. We encourage families to implant prior to their child's third birthday if the child is profoundly deaf, as many children receiving implants at this time obtain spoken language skills comparable to those of children with normal hearing within two years of receiving the device.



The University of Michigan Sound Support Program is made possible by a cost-sharing grant funded by the state of Michigan Medicaid Program and our department. Teresa Zwolan, PhD, CCC-A, and Marci Lesperance, MD, serve as co-investigators on this grant. The goal of Sound Support is to improve the quality, timeliness, and effectiveness of treatment for children who are deaf or hard of hearing and/or who receive Medicaid and Children's Special Health Care Services in the state of Michigan. Sound Support enables our department to make more than 2,300 contacts and referrals with families and professionals dealing with more than 450 children with hearing loss. These contacts included referrals to local agencies such as Early On, Special Education, and Children's Special Health Care Services. In addition, professional mentoring, a strong component of the Sound Support mission, was provided to many students enrolled in audiology, speech pathology, medical school, and residency programs.

Division of Otolaryngology-Neurotology



The Division of Otolaryngology-Neurotology appreciates this opportunity to highlight our activities and share stories about our patients. It has been my privilege to direct the division since 1992, and it has always been my ambition to maintain the level of excellence in patient care, teaching, and research established by my mentors and predecessors, Dr. Malcolm Graham and Dr. John Kemink. These men were giants in our discipline, and we are proud to build on their foundation.

The division has two additional faculty members who provide both medical and surgical care to our patients. Dr. Alex Arts has been a valued colleague since 1993, and serves as director of our highly competitive Neurotology fellowship program. Dr. Hussam El-Kashlan joined our faculty in 1997, completing both his otolaryngology training and the otology fellowship program here. So our division now boasts three senior faculty members at the highest academic rank for the first time in our history. While these academic achievements are noteworthy, the greatest value is to our patients, who receive their surgical care from mature, experienced clinicians and surgeons. We enjoy a collegial and mutually supportive practice, which contributes both to our joy and to our longevity!

An ongoing challenge in the division has been to provide timely access to care for our patients while still meeting the demands of our academic program. We have improved in this area with the addition of two medical otologists to our faculty. In March 2009, we enthusiastically welcomed Dr. Katherine (Katie) Heidenreich, clinical assistant professor. Katie earned her medical degree from the University of

California at San Diego, did her residency at the University of Maryland, and completed a fellowship in vestibular and balance disorders at the Cleveland Clinic. Katie is an outstanding otolaryngologist with clinical interests in general medical otology, Meniere's disease, benign paroxysmal positional vertigo, vestibular neuritis, and facial paralysis. Her background also equips her to be an excellent addition to our vestibular disorders program, where she now coordinates our Vestibular Case Conference. Her recruitment will significantly improve timely patient access for the evaluation and treatment of inner ear disorders.

Syed Rizvi, MD, has been a valued adjunct member of our faculty for many years. He sees medical otology patients in our clinic two days each week, and still maintains a clinical presence in his long-standing practice in Bay City, Michigan. With Drs. Rizvi and Heidenreich on

board, most new patients can now be seen by a physician in the division in 10 days or less.

We are also proud of our Department's distinction as a Cranial Base Destination Program—an institutional initiative that provides concierge service and coordinated care to those who come from outside the immediate geographic region to receive care for several highly specialized diagnoses. Our division's first destination patient came all the way from New York. We hope to further develop our destination program activity in order to enhance access to our specialty care, as well as to strengthen our training program. We are also applying to the Acoustic Neuroma Association for designation as a Center of Excellence, and will be launching a national advertising campaign to attract patients with acoustic neuromas and other tumors of the cranial base for coordinated multi-disciplinary care.

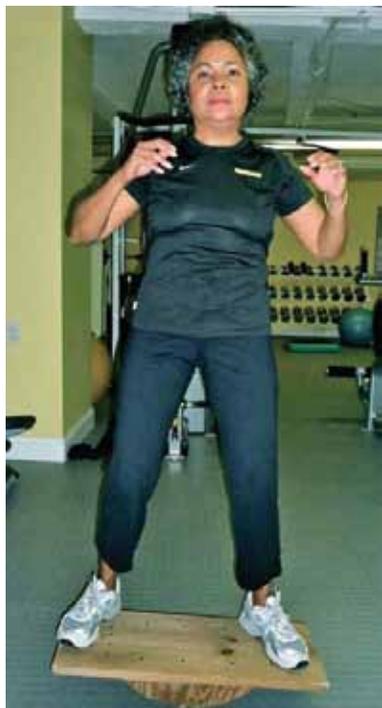
It is our pleasure to provide otologic services to the people of Michigan and beyond. Please feel free to contact us if we can be of service to you or your patients.

Best wishes,

Steven A. Telian, M.D.

John L. Kemink Professor of Neurotology, Division Director, Otolaryngology-Neurotology

NYC Destination Patient “Wants People to Know”

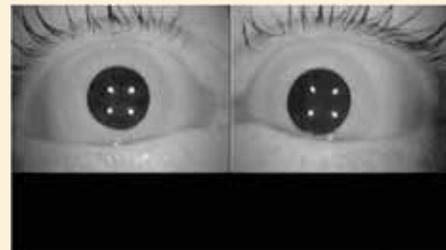


One year post-op, Mrs. Poppleton continues to marvel at her excellent results.

Lorraine Poppleton’s life in New York City as wife, mother, and career woman was fun, full, and healthy until she began to experience a ringing in her ears “like Morse code.” She also had fullness and pressure in her head, as well as occasional severe vertigo. Her hearing, however, was perfect. In 2007, an MRI revealed a right acoustic neuroma within the internal auditory canal, which remained fairly stable until 2009, when it showed significant growth. Thinking herself fortunate to be in a city with world-class medical care, Mrs. Poppleton sought opinions from several neurotologists at prestigious New York medical centers. The first doctor she saw was not only brusque, but full of negative prognoses, predicting a dismal outcome but warning that she would die if she didn’t have surgery. She was also told that her hearing could not be preserved. Another specialist told her that a colleague of his had this surgery and lost his hearing, but “if he could deal with it, so could she!” Incredulous at the callous attitude of her doctors, but compelled by her advancing symptoms, she scheduled herself for surgery, resigned to permanent unilateral hearing loss and lifelong vestibular dysfunction.

Remarkably, just two weeks before the surgery, Lorraine’s son-in-law (a house officer in Dermatology at U-M) called to tell her about a surgical team at U-M that was performing highly successful acoustic neuroma surgeries with a high rate of hearing and facial nerve preservation. Lorraine provided her records, and following review of her MRI and audiogram, she was contacted by telephone and designated as a Destination Program patient. Her care was expedited—all of her preoperative appointments were arranged for a Thursday and Friday, and she underwent surgery on the following Monday. She was released from the hospital in less than a week with normal hearing in both ears, and has returned to her full-time job and other activities, including tennis, working out, and dancing. She wrote in a recent email, “...this past weekend, my family was having a party celebrating the end of summer. I danced my socks off! I love to dance, and don’t know what I would do if I could no longer do this.”

Mrs. Poppleton’s surgeons, Dr. Steve Telian and Dr. Gregory Thompson (Neurosurgery), used a middle fossa microsurgical approach for resecting her tumor—an approach the Neurotology team typically uses for treatment of smaller acoustic neuromas with excellent residual hearing results. The team has improved upon this technically difficult procedure by increasing the exposure of the floor of the skull and approaching the tumors from above the ear, resulting in an 80+ percent success rate for hearing preservation. Prior to coming to U-M, Mrs. Poppleton had only been offered the conventional translabyrinthine approach, which always results in complete hearing loss in the affected ear. Mrs. Poppleton is very grateful for the expert, compassionate care she received, and wanted to share her story, hoping that it will encourage other patients to fully explore all available treatment options for acoustic neuroma.



Clinical Image Featured in *NEJM*

Dr. Katherine Heidenreich’s innovative video of benign paroxysmal positional vertigo—a common peripheral vestibular disorder—was the featured clinical image in the June 2010 issue of the *New England Journal of Medicine* (2010 Jun 24; 362(25): e70 or PMID: 20573921). Dr. Heidenreich has a special interest in vestibular disorders and uses video-oculography goggles to beautifully capture the complex nystagmus in patients with such disorders. In the video, a positive Dix-Hallpike test is shown as fast, upbeat torsional nystagmus, rotating toward the undermost ear. Treatment of benign paroxysmal positional vertigo consists of repositioning maneuvers.

This approach to studying these clinical phenomena offers a state-of-the-art educational tool to both patients and trainees.

Bionic Kids!

The Division of Audiology has established a reputation for its cutting-edge technology and diagnostics. Director Paul Kileny has developed and perfected a diagnostic technique known as transtympanic electrical auditory brainstem response testing (TT-EABR), a minimally invasive preoperative assessment used to determine the presence or absence of a functional auditory nerve necessary for effective cochlear implant stimulation.

TT-EABR is particularly useful for children with congenital temporal bone anomalies, since the absence of a cochlear nerve often accompanies this condition. The most experienced practitioners of TT-EABR in the country, Dr. Kileny and his team have performed several hundred of these procedures over the past several years. Children come from around the country, many initially denied implant surgery because doctors suspect the absence of a cochlear nerve. Once TT-EABR indicates they have a stimuable auditory pathway, they can undergo implantation, including bilateral implant surgery if both ears



Brea Arroyave

stimulate. More importantly, the procedure can also help doctors determine the best ear to implant, or identify the absence of a cochlear nerve suitable for implantation. Studies performed at U-M and elsewhere indicate that for children who receive their implants at a young age (one to two years is ideal), developmental and speech-language delays are greatly reduced. Many, in fact, eventually enter regular classrooms in elementary school.

A few years ago, a one-year-old with profound deafness named Brett came from Georgia for testing with Dr. Kileny and his team. He initially underwent auditory evoked potential studies, but no responses were obtained from either ear, and imaging studies did not clearly identify the presence of cochlear nerves. The TT-EABR studies, however, indicated that both ears were appropriate for implantation. Brett received bilateral cochlear implants between his second and third birthdays. Now attending kindergarten, Brett is academically ahead of many in his class, and is sounding out/reading words. To learn more about his wonderful progress, visit www.youtube.com/watch?v=58dRHttq1xA.

Another patient, Brea, came to us at age two. Brea has Down syndrome, and profound bilateral hearing loss. A temporal bone CT scan performed in her home state indicated congenital temporal bone anomalies, leading doctors to conclude that Brea's cochlea and internal auditory canal might not be connected, possibly indicating the absence of cochlear nerves. The family traveled to U-M for a second opinion. The Audiology team obtained electrically evoked auditory brainstem responses at reasonable levels bilaterally, indicating stimuable cochlear nerves. Brea underwent her first implant in the summer, and is now preparing for an implant in her other ear. Her mother writes: "Wanted to share this with you—Brea is astounding everyone at preschool and us here at home! She is working on vocalizing and some signs as she gets more and more accustomed to sound."

We are thrilled with such triumphant outcomes and anticipate more success stories in the future.



Brett Forsberg

An Endoscopic Challenge

This has been an exciting year for the Cranial Base Program, directed by Dr. Lawrence (Larry) Marentette and now officially “launched” as a Destination Program. This past year, the team has focused on expanding their multidisciplinary endoscopic skull base practice. They have performed more than 25 advanced, minimally invasive skull base endoscopic procedures on patients ranging in age from 4 years to 77 years. The areas they have accessed include the anterior, middle, and posterior cranial fossae, and the infratemporal and pterygopalatine fossae, sella, and parasellar regions. One patient, a 61-year-old man with a multiply recurrent petrous apex chondrosarcoma, underwent initial treatment in 1985 and then multiple subsequent complex surgeries. He presented to our team with a recurrence in the petrous apex of the temporal bone and numbness of the left cheek. The tumor was approximately 90 percent debulked through the nose, via access between the internal carotid artery and the trigeminal nerve in Meckel’s cave, reaching clear to the internal auditory canal. Although one of our most challenging endoscopic cases, the patient was able to return home after surgery with no complications.

Brenda Akey, an active 66-year-old woman, suffered from what she thought was typical sinusitis for several years. She experienced maxillary pressure, a “humming” in her head, and dizzy spells. Eventually, she went to her long-time otolaryngologist, Dr. Deborah Habenicht, for an evaluation and imaging work. When Dr. Habenicht discovered a large infratemporal mass, she referred Ms. Akey to the Cranial Base team at U-M. Her MRI showed a mass centered in the left pterygopalatine fossa, invading the middle cranial fossa, orbital apex, and cavernous sinus. Subsequent biopsy proved the mass was a paraganglioma, for which she underwent preoperative embolization and subsequent endoscopic resection and reconstruction with Dr. Erin McKean Lin (Otolaryngology) and Dr. Stephen Sullivan (Neurosurgery). Two days after surgery, Ms. Akey was discharged from the hospital and seven months later, she is still doing well, showing no signs of recurrence.

Coming from a small town in western Michigan, Ms. Akey admits she was intimidated by the enormous size of the U-M Health Center, but was pleasantly surprised to discover that the Otolaryngology staff made her “feel like family.” She noted that it was so important to her that people were considerate, honest, and deliberate in their answers to her questions, and that everyone on her care team, from the physicians to the nurses and clerks, treated her with kindness and compassion.



Brenda Akey, with her surgeon, Erin Lin, MD.

Save the Date!

John Kemink MD Memorial Lecture

April 1, 2011, Ann Arbor

Annual Charles J. Krause Lectureship

June 24, 2011, Ann Arbor

Michigan Work Society

November 9–10, 2012, Ann Arbor

WELCOME NEW HOUSE OFFICERS!!

We are excited to welcome our newest house officers to our training program. They will complete their first year as interns in the Department of Surgery. As always, we are amazed by their accomplishments and are eager to have them join us on their path to what will surely be impressive careers in our field.



Sarah Jo Burgin, MD, completed her undergraduate degree at Notre Dame University and earned her medical degree at the Indiana University School of Medicine in Indianapolis, where she received the Medical Student Research and Scholarship Award.



Scott J. Cronin, MD, graduated from The Ohio State University and received his medical degree from there as well. During medical school, he was honored with several Dean's Awards for outstanding scholarship and with the Hendrix Leadership Award.



Sarah Jane Novis, MD, received both her undergraduate and medical degrees from Northwestern University. During medical school, she was elected to represent the Feinberg School of Medicine on both the state and national level as a voting member of the AMA Medical Student Section.



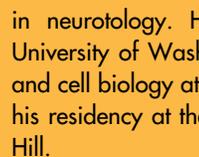
Michael W. Sim, MD, earned his BA in sociology from the University of California–Berkeley and completed medical school at Loma Linda University School of Medicine, where he received honors in nine disciplines and served as a site leader for the Healthy Neighborhoods Project in San Bernardino.

MEET OUR NEW FELLOWS

We enthusiastically welcome seven new fellows to our program this year, each serving one to two years in one of our specialty areas. We are honored to have them join us for this advanced training, and we look forward to their contributions to our work.



Sumeet Anand, MD, joins us for a one-year advanced head and neck oncology reconstructive surgery fellowship. He earned his medical degree at Michael G. DeGroot School of Medicine, McMaster University in Hamilton, Ontario, and completed his residency at McGill University in Montreal, Quebec.



Gregory Basura, MD, PhD, will pursue a two-year fellowship in neurology. He completed medical school at the University of Washington in Seattle, his PhD in anatomy and cell biology at Wayne State University in Detroit, and his residency at the University of North Carolina, Chapel Hill.



Michael Brandt, MD, will pursue a one-year fellowship in facial plastic and reconstructive surgery. He completed both his medical degree and residency at the University of Western Ontario in London, Ontario.



Cameron Budenz, MD, will engage in research in the department's Advanced Research Training Program (ARTOP). She received her medical degree from U-M and completed her residency at New York University Medical School.



Ericka King, MD, joins us for a year of advanced training in pediatric otolaryngology. She completed medical school at the University of Washington School of Medicine in Seattle, and her residency at the Medical College of Wisconsin in Milwaukee.



Naweed Raza, MD, received his medical degree from McMaster University in London, Ontario, and completed his residency at the University of Manitoba in Winnipeg. He will pursue a two-year fellowship in head and neck surgery.



Mahdi Shkoukani, MD, joins us for a one-year fellowship in cranial base surgery. He completed both his medical degree and residency training at Wayne State University in Detroit.



NEW FACULTY

Four outstanding faculty have joined our department this year, adding significant strength and depth to our clinical, educational, and research programs.



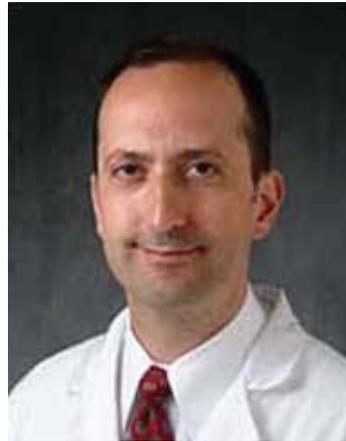
The recruitment of Assistant Professor **Scott A. McLean, MD, PhD**, to the Division of Head and Neck Oncology has brought us expertise in the areas of cutaneous oncology, head and neck oncology, craniomaxillofacial surgery, and facial reconstruction. With his diverse skill set, Scott has become a

highly valued teacher. After earning his medical degree and a PhD in medical sciences from the Medical College of Ohio in Toledo, Scott completed his residency at the Mayo Clinic in Rochester, MN, and a cranial base fellowship at U-M. We are delighted to welcome him back to our department.



Jeffrey John Stanley, MD, clinical assistant professor, is our first true general otolaryngologist. A graduate of the University of Illinois College of Medicine at Chicago, Jeff spent several years in academic and private practice before pursuing a fellowship in sleep medicine at the University of New Mexico in

Albuquerque. His clinical interests include sleep medicine, sleep apnea, adult and pediatric sleep disorders, and head and neck surgical oncology. With Jeff's arrival, we are now one of only a few departments in the country with two board-certified sleep medicine fellows. Jeff will divide his time between our Livonia Center for Multispecialty Care and the Taubman Center clinic.



Mark Zacharek, MD, clinical associate professor, is a fellowship-trained rhinologist and is also certified in otolaryngic allergy. He will split his time between the Michigan Sinus Center in Livonia and the Taubman Center clinic. Mark's practice will focus on sinusitis, allergic rhinitis, allergy immu-

notherapy, nasal polyps and masses, and endoscopic sinus surgery. Among his research interests are the mechanisms and treatment of chronic rhinosinusitis, including the radiologic staging of this disease. Mark completed his MD and residency at Wayne State University in Detroit, and pursued a fellowship in rhinology and endoscopic sinus surgery at Oregon Health & Science University in Portland.



Vasu Divi, MD, a clinical lecturer, has joined our Head and Neck Cancer Destination Program. He completed both his medical degree and residency at U-M prior to pursuing advanced fellowship training in head and neck oncologic surgery and microvascular free flap reconstruction at the

Massachusetts Eye and Ear Infirmary in Boston. His clinical practice will focus on general head and neck disease, head and neck oncology, microvascular and Mohs reconstruction, transoral robotic surgery and skull base surgery, and facial plastic and reconstructive surgery. Vasu will pursue health policy and health outcomes research. We are pleased to welcome Vasu back to Ann Arbor.

“Photographs and Memories”

(from Jim Croce 1974)

After 38 years of service, Jim Bruce retired from Otolaryngology–Head and Neck Surgery on November 1, 2009. He had the distinction of being the second longest-serving employee in the department. Over the years, he produced literally tens of thousands of slides and photographs, medical drawings, posters, and logos. Already, we miss Jim’s incredible talent and service to our department.

In 1971, shortly before graduating from Washtenaw Community College, Jim exhibited some of his work in an art show for graduates, receiving a Best of Show award for his efforts. When a representative from U-M saw Jim’s work, he encouraged Jim to apply for a graphic artist position in the Department of Otorhinolaryngology. After several interviews, he was hired by Drs. Walter Work and Merle Lawrence.

Back then, commercial artists would hand-letter the text and artwork for a project, and then they would photograph both to produce a negative. They would then dye the negative by hand to create a 35mm slide. In addition, they would draw all charts, graphs, and illustrations by hand in ink and then copy them to film for display. Posters consisted of 4' x 8' colored matted boards that were cut into manageable strips and then reassembled for hanging.

After Dr. Charles Krause arrived to chair the Department in 1977, computers slowly began to be used to produce graphic art and Jim received one installed with the CAD/CAM (Computer Aided Design/Computer Aided Manufacturing) program. At that time, a CAD/CAM operator needed to know college-level algebra, trigonometry, manual drafting



Big Jim and his grandson little Jimmy

practices, the Windows operating system, 2D and 3D CAD, manual shop practices, and how to manually program certain machines. To keep abreast of new software such as CAD/CAM and HyperText Markup Language (HTML), Jim took many classes over the years at Eastern Michigan University, U-M, and the Computer Learning Center.

Early in Jim’s career, the Department employed three photographers, one cinematographer, and two graphic artists. With the arrival of new software, the photographic and graphic arts staff was eventually reduced to a single employee—Jim. For more than a decade, Jim singlehandedly produced the Department’s slides, photographs, medical drawings, posters, and logos. About 10 years ago, he helped transform the Walter Work Conference room into a state-of-the-art, multimedia gathering place. Most recently, he managed the Department’s digital imaging.

Before becoming a commercial artist and technical illustrator, Jim served two tours of duty in Vietnam as an Army Ranger. The money he saved while soldiering, along with a college grant from the U.S. Army, enabled him to go to college to pursue his associate in arts degree. Currently, Jim lives on a 40-acre tree farm in Manchester, Michigan, with his dog Bear and cat Boo. He enjoys fishing on his four-acre pond, gardening, and riding around on his Harley Davidson. Next spring he plans to ride solo from Manchester to Eugene, Oregon, to visit his son and grandson—a 2,350 mile trek one way! We wish him a safe and wonderful trip!

Jim—from all of us here and from the many, many alumni you have so loyally served, THANK YOU for all your hard work, and best wishes for much fun and adventure in the years ahead.

Artist Canvasses Harsh Realities of Deafness

When Warren Miller turned 16, his mother got out the good china and invited several of his deaf friends over for a birthday celebration dinner. Food was served, but before long, forks were laid down between bites and the group of 16-year-olds began signing—and laughing—and signing—and laughing even harder than before.

“Warren,” his mother interrupted. “What is so funny?”

“Oh,” he answered his mother, “We’re telling jokes!”

Warren has been clinically deaf since he was very young, although he has partial hearing in his left ear. Treated often in Otolaryngology, he has endured countless tests, hearing aid fittings, and special education and speech therapy sessions. Early on, his doctors and specialists all agreed on one thing, which was to get Warren hearing and making sounds of his own as soon as possible. But back then, hearing aids were unrefined and cochlear implants nonexistent, so Warren lived in the deaf world, using American Sign Language and lip reading to communicate. Luckily, as a young child, he received help in developing his language skills, so that he could converse.

Warren’s artistic career began taking shape when he was a child. His parents gave him pencils and pads of paper to draw on during church services and long car rides, or when he was bored at home. They soon recognized that he had an artistic gift. By the time he was a teenager, Warren drew constantly and wanted to learn everything he could about art so he could pursue graphic design courses in college. He ended up studying graphic design for five years at the Rochester Institute of Technology in New York.



After college, Warren landed a job as a graphic artist at the Indianapolis Museum of Art, which involved designing posters for upcoming museum events. One in particular caught the eye of the mayor of Indianapolis. When he called the museum to ask for a copy of the poster and was told there were no prints for sale, he encouraged the receptionist to make Warren’s art available in the museum’s gift shop.

Similar to many artists who struggle to make a living, Warren ended up switching jobs and locations several times in pursuit of a better income. Eventually, he returned to Indianapolis to work as an art director in a small manufacturing company, Wood-Mizer. After working there for eight years and receiving praise for

his efforts, Warren lost his job when Wood-Mizer was forced to downsize. He was left with a wife and child to support with little money.

Each week, Warren puts on a professionally designed (by him) sandwich sign and walks the busiest business strip in Indianapolis, speaking with passersby and handing out business cards. “I need a job,” he says, smiling, “and I have gotten all favorable responses from people I talk with.” In addition to this work, Warren is drawing and painting again. Letting his thoughts and creativity guide his hand, he produces large-scale, “pop art” canvases that make a strong impact with their primary colors and moving subject matter. His work is a compelling reminder of a time when Warren was dubbed “handicapped” and was dismissed from job interviews because of his inability to hear, as well as of an artist’s struggle to make a living in today’s troubled

economic times. We in the Department are privileged to provide Warren’s care, and are inspired by his spirit. Warren was recently interviewed by CNN’s Kyra Phillips. To see the interview and his 30-second pitch, visit <http://newsroom.blogs.cnn.com/category/anchors/kyra-phillips/30-second-pitch/>

To view Warren’s gallery, please visit www.warrenmillerart.com/

Note: Information for this article was submitted by Darla Miller, who worked in our Department for 19 years as a clinic manager and patient representative. An avid writer, Darla has had several articles featured in local magazines and newspapers. We are grateful for her contribution of Warren Miller’s story.

Oto Outreach Efforts

The Department of Otolaryngology at U-M is proud of our many efforts to provide medical care in areas where high-quality care is difficult to obtain.



Honduras Mission Trip

- Chief Resident Andy Shuman, MD, coordinates monthly clinics that offer free ENT consults at Ypsilanti's Hope Clinic, along with assistant professor Erin Lin, MD, and other volunteers. The ENT Clinic was initiated by former resident Lamont Jones, MD, and is now in its sixth year. HOPE provides free primary care each year for more than 7,000 patients without insurance or the ability to pay for health care.
- This spring, our Department held its annual free community throat cancer screening in collaboration with U-M's Comprehensive Cancer Center (see picture below). Directed by Norman Hogikyan, MD, the event was a part of World Voice Day and Oral, Head and Neck Cancer Awareness Week. Thirty volunteers saw more than 60 patients and identified 8 patients needing follow-up biopsies for lesions. For more information,

visit www.med.umich.edu/insideview/volume5/issue4/Articles/applause/kudos.html.

- For the seventh consecutive year, several departmental members joined a team of physicians, residents, nurses, students, audiologists, and translators on a week-long head and neck surgery mission trip to La Ceiba, Honduras. Led by Dr. Carol Bradford, the team provided care for hundreds of patients in a local clinic and performed more than 50 surgical procedures. Care for the patients continued after the team's return. In the case of one young girl diagnosed with a potentially fatal thyroid carcinoma, the team arranged for her to travel to the NIH each year for follow-up treatment. Today, the patient is disease-free, a compelling example of our efforts to make a real difference in patients' lives.
- In December, Professor Shan Baker, MD, traveled to Vietnam on a Face to Face mission. Face to Face is a humanitarian and educational surgical exchange program sponsored by the Educational and Research Foundation for the American Academy of Facial Plastic and Reconstructive Surgery (AAFPRS). Throughout the world, AAFPRS surgeons provide complimentary plastic and reconstructive surgery of the face, head, and neck to patients with facial deformities caused by birth, domestic violence, war, or other trauma.



LETTER FROM THE DIRECTOR



Welcome back to our newsletter. Your response to our first issue was great, and we are happy to be able to (re)connect with a large number of our alumni and colleagues. Please, keep your letters and email messages coming and let us know what is on your mind. This should be your forum as well as ours.

“KHRI at 50” was very much at the core of our last chat and it indeed became the event that we had hoped for: a celebration of our (and hence, your) accomplishments over the past decades, highlighted by the symposium “Pathology of the Inner Ear.” With an international cast of speakers, the Lawrence-Hawkins Lecture Day with our distinguished alumna Barbara Canlon (KHRI 1979–1982; now professor at the Karolinska Institute in Stockholm), and a series of public lectures, the event drew a wonderful mix of scientists, researchers, alumni, and friends. If you did not have a chance to join us, you can look at the programs that are still posted on our website www.khri.med.umich.edu. The four public lectures on topics of hearing and hearing loss were given as part of the popular U-M Saturday Morning Physics series and were recorded for posterity and your enjoyment (www.lsa.umich.edu/physics/seminars/smp). To further commemorate our anniversary and also to honor our founding father, Merle Lawrence, our department will establish the Merle Lawrence Professorship. You will hear from us separately as to how you can help us to finalize this goal.

Just before we officially turned 50 years old, the original KHRI building was demolished. But, yes! as I had promised, we salvaged a handful of bricks from our ancestral home for those with nostalgic feelings toward the “good old days” or with a desire for a sturdy paperweight. Check out our website to learn how you can become the proud owner of one of them (or two, if you’d like to make them bookends).

Another issue that has been occupying our time and minds is the search for my successor. After ten years of service, I am ready to turn over the reins of KHRI to the next generation. The search that started earlier this year is in full swing, and we are hoping to have the next director appointed by the spring of 2011. Since you might be wondering—no—I am not retiring from research yet. I am really looking forward to finding out what a laboratory looks like from the inside again.

Several changes have occurred since our last communication. David Dolan moved into emeritus status but maintains his involvement in our Physiology Core. Su-Hua Sha accepted a tenure-track position at the Medical University of South Carolina in Charleston. We’ll miss you, Shasha, and wish you good luck for the future! Our funding base, fortunately, has not changed much and is still solid.

Despite its age, KHRI is not over the hill but rather is still full of energy and ready to tackle the challenges that lie ahead of us. Progress toward our goals of advancing scientific knowledge is undiminished, and we remain in the forefront of basic and translational hearing research and of training the future generations of scientists and clinician-scientists worldwide.

Best wishes to all of you,

Jochen Schacht, PhD
Professor and (still) Director

- Twice each year, several of our clinical faculty, residents, and nurses travel to third-world countries with Medical Missions for Children (MMFC; www.mmfc.org), a non-profit organization providing free medical, surgical, and dental care to underprivileged children and young adults. The Oto team repairs/reconstructs cleft lip/palate and ears. This year, Jennifer Kim, MD (Facial Plastics & Reconstructive Surgery) and Sue Hadden RN, BSN (Pediatric Otolaryngology) participated. Dr. Kim has volunteered her time to MMFC for many years, performing microtia surgery (making an ear from rib cartilage), a process that can take up to four years to complete!
- In November, several audiologists from our Department (Bruce Edwards, AuD; Crystal VanDerHeyden, AuD; and Suparna Malhotra, AuD, CCC-A) volunteered their services at the Savas Health Expo in Livonia, Michigan. More than 300 participants received free health screening, including free hearing tests!

KHRI Collaborators Regrow Auditory Nerve Fibers to Enhance Cochlear Implants

Collegial spirits and collaborative efforts among several labs at the Kresge Hearing Research Institute (KHRI) have produced multi-disciplinary and translational research that will hopefully provide new breakthroughs for the deaf, including enhanced results for patients with cochlear implants (CIs).

Cochlear implants bring sound to many deaf ears and enable deaf people to engage in verbal communication. However, it remains difficult for people with a cochlear prosthetic to hear music and to understand speech in noisy environments. One possible way to enhance the benefits derived from the cochlear implant is to improve connectivity with the auditory nerve in deaf ears.

Working together, the laboratories of Richard Altschuler, PhD, Bryan Pflugst, PhD, and Yehoash Raphael, PhD are developing methodologies for stable and long-term regeneration of peripheral auditory nerve fibers in deaf ears. Their work deals with several parameters that will likely enhance the outcome of CI procedures. These parameters include proximity of electrode to nerve fibers, stimulating a nerve ending instead of a soma, reducing impedance, enhancing the physiological state of spiral ganglion neurons (SGNs) and their rate of survival, and strengthening their connections to the cochlear nucleus, the connection site of the nerve in the brain.

Using guinea pigs, these KHRI investigators tested the hypothesis that the presence of regenerated auditory nerve fibers in the deaf cochlea will enhance the function of CIs (*Exp Neurol.* 2010 Jun; 223(2): 464–72. PMID: 20109446). As a first step, the research team demonstrated that ears that undergo experimental deafening can be induced to regenerate nerve fibers through the gene transfer of BDNF, a molecule known to enhance nerve survival and growth. The regenerated fibers survived in the deaf ear for many weeks and tolerated stimulation by the cochlear implant electrode.

The experiments are now expanding to include testing of the psychophysical outcomes in the guinea pig model and the anatomical changes in the cochlear nucleus. The tools used in these experiments not only advance our basic science knowledge, but also have the potential for rapid translation to clinical practice. Potential benefits for implanted patients include improved noise, speech, and music perception. In addition, these studies offer hope that in the future stem cell therapies can be used to help restore hearing.



Regenerated nerve fibers (red) induced to grow into the cochlear epithelium region (green) of a profoundly deaf ear.

Collaborators Take CHARGE

OTO staff and faculty in both clinical and research areas have been working on CHARGE, the most common congenital cause of deaf-blindness in the United States. Because of the multi-faceted nature of this disease, many providers are usually involved in caring for patients with CHARGE, including ENT specialists who treat issues related to hearing, balance, choanal atresia, swallowing, and so forth. Now that the CHARGE gene, CHD7, has been identified and mouse models are available, researchers can study specific developmental defects caused by the CHD7 mutation.

At the U-M Otolaryngology clinic, Director Paul Kileny and audiologists Bruce Edwards and Lori Van Riper gathered data on pediatric patients with CHARGE to identify a “window of opportunity” for audiologic intervention. They looked at patients’ average age at the time of hearing loss, hearing test results, and congenital facial paralysis as a predictor of sensorineural hearing loss. They found that audiologic intervention in the first few months of life is optimal, as early evaluation of hearing loss and appropriate amplification can be critical determinants for auditory habilitation, acquisition of speech and language, and other aspects of infant development.

Across campus, Donna Martin, MD/PhD, and Elizabeth Hurd, PhD (Human Genetics) collaborated with Yehoash Raphael, PhD, David Dolan, PhD, and others from our Kresge Hearing Research Institute in developing a mouse model to study the precise developmental defects caused by mutated CHD7. They studied inner ear defects in CHARGE mice and found that CHD7 is necessary for the proper formation of semicircular canals and cochlea, for the correct proliferation of neural progenitor cells, and for the development of the sensory epithelium. Their work will deepen our knowledge of the basic developmental mechanisms that go awry in disorders of hearing and balance, and could lead to further insights about therapeutic repair and regeneration (*Development*, PMID: 20736290).

At Mott Hospital, pediatric otolaryngologists use state-of-the-art surgical techniques such as endoscopic and stentless choanal atresia repair, Baha implantation (to bypass middle ear defects), and a unique otoplasty for external ear abnormalities. Children are tested for DNA mutations in the CHD7 gene. Clinical collaborations among pediatric specialists enable coordinated care, and plans for a clinic devoted exclusively to children with CHARGE are underway.

With this unique critical mass of clinicians and researchers working on CHARGE, it is likely that the resulting research data will lead to breakthroughs in the diagnosis, treatment, and our ability to cure children with CHARGE and other hereditary deafness problems.

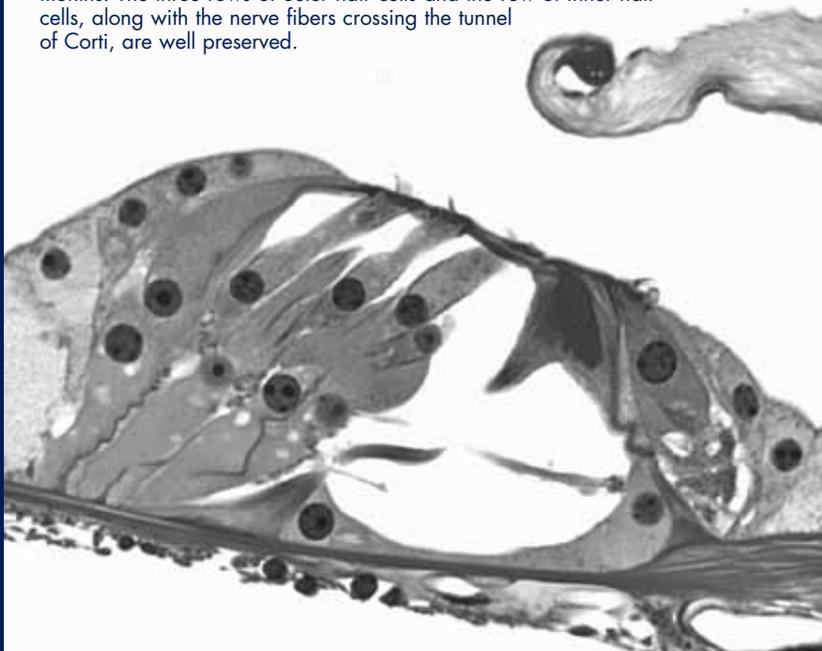
Hearing Preservation in Cochlear Implantation

There is excitement in the Auditory Prosthesis Perception and Psychophysics labs about the collaborative experiments being done to determine the effects of hearing preservation on psychophysical responses to cochlear implant stimulation. Residual acoustic hearing is known to enhance cochlear implant function, so the strategy is to preserve as much as possible in the implanted ear so that patients can use both acoustic and electrical signals to achieve optimal hearing. Adult guinea pigs underwent acoustic psychophysical training and were then placed in a group with either ototoxically treated (neomycin) or normal cochlear-implanted ears. Psychophysical responses to implant stimulation were then recorded and electrical detection thresholds were measured.

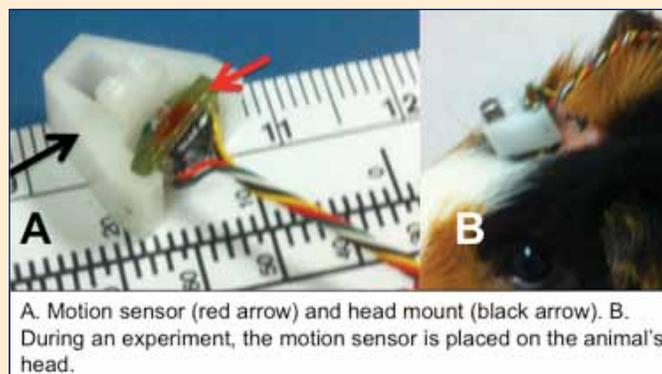
The researchers demonstrated among other results that remarkable preservation of the inner ear structures and behaviorally assessed acoustic hearing can be achieved in guinea pigs with cochlear implants. They also found that electrical hearing is different in animals with good cochlear preservation compared to animals with appreciable hair-cell and neural degeneration. Specifically, in animals with good nerve survival and normal spontaneous neural discharges in the auditory nerve, the temporal features of electrical hearing with the implant more closely resembled those in normal hearing animals than they did in animals with poor nerve survival and a spontaneously silent auditory nerve.

First author Stephen Kang, MD, currently a HO II in the department, conducted this work during his research year in medical school in the laboratories of Bryan Pflugger and Yehoash Raphael. His work was supported by the NIDCD, the Alan and Berte Hirschfeld Foundation, and the R. Jamison and Betty Williams Professorship. To read more about this work, see Kang et al., *J Assoc Res Otolaryngol*, 2010, 11: 245–65. PMID: 19902297.

An organ of Corti from an animal that was implanted and stimulated for 14 months. The three rows of outer hair cells and the row of inner hair cells, along with the nerve fibers crossing the tunnel of Corti, are well preserved.



KEEP YOUR BALANCE! (Noise-Induced Vestibular Dysfunction)



Repeated exposure to intense noise can cause hearing loss. Studies underway in Dr. Michael King's laboratory in the KHRI suggest that noise exposure sufficient to cause hearing damage in guinea pigs may also damage the delicate inner ear balance (vestibular) mechanism. Researchers assess hearing loss in animals by measuring an electrical potential produced by auditory stimuli (auditory brainstem response or ABR). Since Dr. King and his colleagues can't perform a similar test to measure vestibular function, they have had to develop novel behavioral methods to detect vestibular abnormalities that noise exposure might cause. The most promising test is to observe head movements that occur during an abrupt movement of the animal. You can imagine the head on the body as an upside-down pendulum, with the massive head perched atop the narrow spinal column. Because of its size and weight, the head tends to oscillate to and fro when the body moves abruptly; one role of the vestibular system is to stabilize the head and minimize these oscillations.

Our talented technical core, Chris Ellinger (senior electrical engineer) and Dwayne Vaillencourt (senior mechanical engineer), designed and built a miniature 3-dimensional inertial sensor (see figure above) to obtain these measurements in guinea pigs. Head oscillations are measured by mounting the device on an animal's head and then placing the animal on a computer-controlled turntable. The turntable is abruptly rotated and the resultant head movements are measured by the device, which senses the motion of the head in space.

Preliminary results suggest that noise similar to what people might experience near the speakers at a rock concert may interfere with the vestibular system's ability to control undesirable head movements caused by movements of the body (such as occur during walking). If confirmed by further research, these findings suggest that some balance problems, which are usually associated with normal aging, might be related to environmental noise exposure during one's lifetime or to excessive noise associated with the workplace or military service. Based on these results, Dr. King hopes to translate the new test methods used with animals to the clinic and to develop new ways to detect balance disorders in patients that current diagnostic tests may miss.

MICHR Chooses KHRI Sensory Neurobiology Lab for Clinical Trials

Dr. Susan Shore's laboratory received a MICHR (Michigan Institute for Clinical and Health Research) grant this year to explore the hypothesis that similar underlying mechanisms exist in tinnitus and fibromyalgia (FM). Our own director of Audiology, Paul Kileny, PhD, and Drs. Sundgren and Harris of Anesthesiology, will collaborate on the study, which is currently seeking participants. Enhanced responsiveness of FM patients to multiple sensory stimuli suggests that FM is associated with general CNS augmentation of sensory inputs, including auditory stimuli. Tinnitus patients also display hyperacusis, along with a somatosensory component. Some patients can modulate their tinnitus with maneuvers such as jaw clenching, while others attribute onset to a somatosensory insult. With both fibromyalgia and tinnitus, patients show increased activity in the insula. Currently, we don't know whether these patients are hypersensitive to other modalities besides hyperacusis, or whether somatosensory tinnitus patients are more likely to exhibit hypersensitivity than patients without a somatosensory component. In animals with noise-damaged cochleas and resulting tinnitus, neurons in the cochlear nucleus show enhanced responses to auditory and somatosensory stimulation. These link

to evidence of increased glutamatergic inputs from non-auditory regions to the cochlear nucleus following deafness, suggesting that fibromyalgia and somatosensory tinnitus share common pathophysiological features, including increased glutamatergic activity and sensory augmentation. Using proton MRIs, this work will investigate whether patients with somatosensory-based tinnitus have augmented multisensory responses similar to patients with fibromyalgia, and whether they demonstrate increased glutamatergic activity in the insula.

Dr. Shore presented her latest research in a symposium at the November national meeting of the Society for Neuroscience: "Ringing Ears: The Neuroscience of Tinnitus." Only about 20 percent of submitted proposals are accepted, so this is a proud achievement!

In her talk, she reported breakthrough research on how tinnitus is generated by the brain when hearing loss occurs—research that may have broad implications for public policy and for mechanisms of normal auditory perception. In addition, her article, written in collaboration with noted international experts on tinnitus (Roberts, Eggermont, Caspary, Melcher, and Kaltenbach) has been accepted for publication in the *Journal of Neuroscience*.



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