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The University of North Carolina at Chapel Hill
Department of Otolaryngology/Head and Neck Surgery

Heads Up

A newsletter for alumni, colleagues, and friends of the Department

Minimally Invasive Head and Neck Surgery:
Advancements Through Technology and Collaboration

In October of 2009, Dr. Zanation got a phone call from one of our referring physicians in the Piedmont Region. He had seen a very pleasant 15-year-old girl with progressive vision changes and CT scans revealed a large boney mass extending from her skull base well into the left eye (see figure A). The patient and her family were appropriately anxious but also inquired about the possibility of "minimally invasive surgery." Dr. Zanation's specialty and fellowship training is in the area of Endoscopic and Minimally Invasive Sinus and Skull Base Tumor Surgery, and he saw the patient five days later for consideration for surgical treatment. Again, the patient and the family asked about "minimally invasive surgery." Dr. Zanation explained to the patient that the tumor extended well into the cone of the orbit and that makes endoscopic transnasal surgery more difficult; however, at UNC we had recently performed four other endoscopic orbital tumor surgeries.

The patient was taken to the OR and the benign tumor was completely resected from the skull base and the orbit endoscopically through the nose (see figures B and C). First, the medial portion of the tumor was bisected with a high-speed drill up to the level of the skull base. After room was made, the medial orbitotomy was enlarged and the medial and inferior rectus muscles were identified and preserved, while the intraconal portion of the tumor was dissected free and removed en-bloc. The patient was discharged home with no incisions, no packing, and normal vision after a 24-hour observation in the hospital.

Dr. Adam Zanation (right) and Dr. Keith Ladner (left, chief resident) performed the first robotic head and neck surgery in North Carolina. In the background is the da Vinci Robotic Surgery System.

Dr. Zanation and collaborators from the University of Pittsburgh and Saint John's Health System in Santa Monica, California, have recently submitted the first series of 16 patients with endoscopic orbital tumor resections for publication.

This case begs the question: What is minimally invasive surgery and how does one safely advance and study these new surgical techniques? Dr. Zanation believes calling the case above "minimally invasive" almost does it a disservice.

Continued on page 2

This patient underwent significant risks to the brain and her vision, so minimally invasive doesn't mean minimal risks. Dr. Zanation believes minimally invasive surgery means any novel techniques that result in less functional and quality of life deficits without compromising the long-term efficacy of the surgery. For endoscopic skull base surgery, the primary benefit is no brain retraction and no need for a formal craniotomy. These advantages have the potential to limit brain trauma and improve neurocognitive and neurofunctional outcomes, and if improved cosmetic or "no incision" surgery is possible, then it is a secondary benefit. So how does a surgical team study these new techniques?

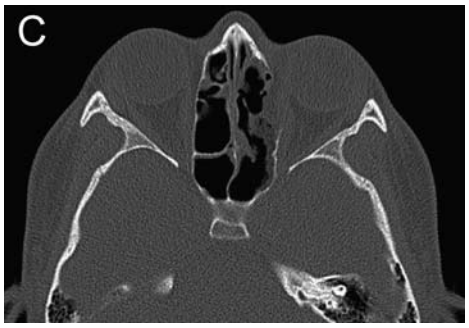
Surgical science is rooted in a foundation of step-wise thought. First, the approach or technology must be conceived, and then pre-clinical testing illustrates the feasibility of new approach prior to patient application. The next step takes the surgery to highly selected patients with the short-term goal of studying technical limitations and peri-operative safety. Lastly, longer-term primary outcomes such as tumor control must be studied. All these are within the bounds of routine clinical care; however, studying cost, quality of life, and specific functional outcomes takes additional effort and planning outside the realm of clinical care.

This pathway of prospective, hypothesis-driven, and controlled evaluation of cost, quality of life, and functional outcomes is one of keystones for the Zanation-Ebert Lab. Dr. Charles Ebert is a new attending faculty at UNC with fellowship training and a special interest in complex and minimally invasive surgery for sinonasal inflammatory disorders. He and Dr. Zanation have joined in a collaborative lab group to develop and study the outcomes of novel surgical techniques and technologies. This collaboration has been immensely successful, resulting in a significant volume of research ideas and data, including three newly active, prospective clinical surgical trials in only nine months. This success and model lead Dr. Zanation along with Dr. Robert Buckmire to conceive of the University of North Carolina Minimally Invasive Otolaryngology/Head and Neck Surgery Center.

The UNC Minimally Invasive Otolaryngology/Head and Neck Surgery Center has been set up as the first such center in the United States. The mission statement of the Center is *Advancing functional and quality of life outcomes in Otolaryngology/Head and Neck Surgery through technology, research, and minimally invasive surgical techniques*. It is an umbrella for all types of advancements in surgical techniques and morbidity across *all* subspecialties of Otolaryngology (from Head and Neck Surgery to Laryngology to Rhinology, etc.). The goal of the Center is to advance surgical care while prospectively studying surgical outcomes. This Center is open to all fields of Otolaryngology/Head and Neck Surgery at UNC, and we hope through cross-pollination of ideas from different specialties we can even further advance minimally invasive techniques and technology, such as robotic assisted surgery (see *The UNC Robotic Head and Neck Surgery Program*, page 3), across multidisciplinary fields. The long-term goal of the Center is to obtain

A. Pre-operative coronal CT scan showing skull base and orbital mass.

B. Post-operative coronal CT with complete resection of mass via an endoscopic approach.



C. Post-operative axial CT scan with complete resection.

Chair's Corner


Harold C. Pillsbury, MD
Department Chair

This issue of *Heads Up* is very telling of the progress that we have made in our Department at both the research and clinical levels. The utilization of the robot in the clinical arena is extremely exciting. In addition, the development of minimally invasive techniques in approaching the skull base has allowed us to perform operations which previously would have been extremely morbid to the patient.

The continued efforts that we have in Malawi are emphasized by Dr. Carlton Zdanski's collaboration with Dr. Carol Shores, who has had a long-standing commitment to the Head and Neck Surgery effort there.

Our research accomplishments have rounded out the missions of the Department. Our medical students, Adam Campbell and Tom Suberman, have done a tremendous job in the laboratory working on issues related to cochlear implantation. They have presented at the American Otologic Society and the American Neuro-Otologic Society in early May.

Finally, it was wonderful for me to reminisce with John Emmett, who was a co-resident of mine in Otolaryngology/Head and Neck Surgery here at UNC in the 1970s.

I hope you enjoy reading this as much as I have.

research funding to support these areas of development and research while advancing surgical techniques within Otolaryngology.

Currently active prospective clinical trials within the UNC Minimally Invasive Otolaryngology/Head and Neck Surgery Center are listed below. We hope to open such outcomes trials within each division of the Department of Otolaryngology/ Head and Neck Surgery. Multiple other technical, anatomic and retrospective studies are also underway:

1. Prospective Morbidity, Quality of Life and Neurocognitive Outcomes after Skull Base Surgery

2. Prospective Evaluation of the Clinical Impact and Outcomes of a Multidisciplinary Head and Neck Tumor Board

3. Analysis and Comparison of Outcomes, Gene Expression Profiles and Eosinophilic Pathways in Allergic Fungal Rhinosinusitis

For more information on the UNC Minimally Invasive Otolaryngology/Head and Neck Surgery Center, see our website coming soon at unc-net.org or call 919-966-3343 for Dr. Zanation.

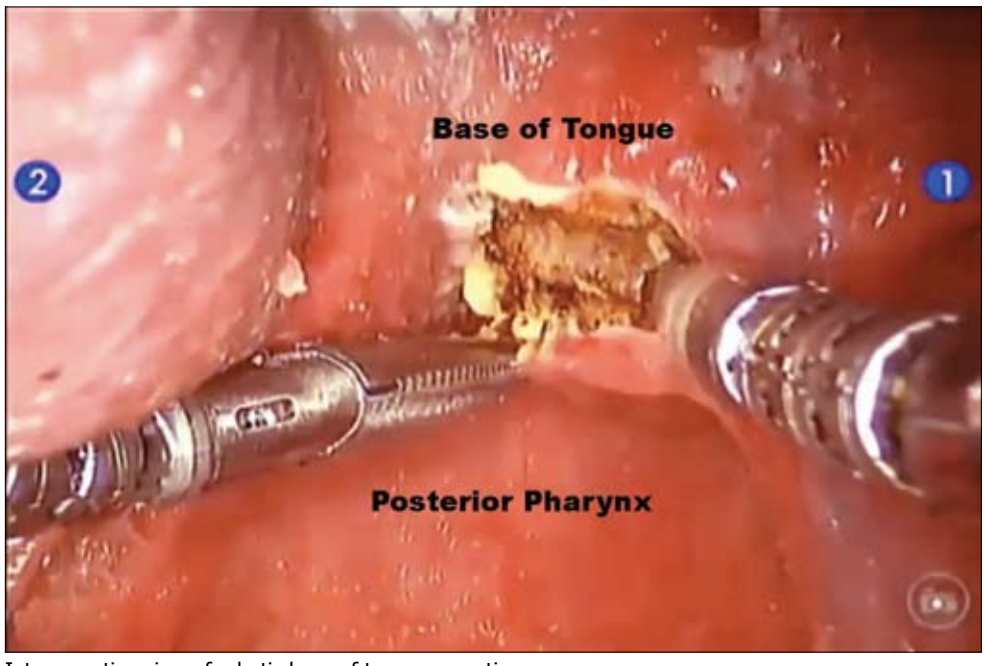
The UNC Robotic Head and Neck Surgery Program

In March 2010, the Dr. Zanation performed North Carolina's first Transoral Robotic Head and Neck Surgery (TORS). This surgery was the culmination of over 12 months of work to set up a Robotic Head and Neck Surgery Program with the help of the CARES (Computer And Robotic Enhanced Surgery) Center at UNC. In December 2008, Dr. Zanation met with Dr. John Boggess, Department of Obstetrics and Gyncology, to discuss a future robotics program for Otolaryngology/Head and Neck Surgery. Dr. Boggess is internationally renowned for his techniques and research with robotic assisted surgery for Gynecologic Oncology. With Dr. Boggess' mentorship and support, Dr. Zanation began training with the *da Vinci* Robotic Surgery System in the Fall of 2009. Our first patient had a base of tongue procedure without complications.

The *da Vinci* robotic surgery system is a three-dimensional endoscope-based robot with three articulating instrument arms. As the surgeon operates, state-of-the-art robotic and computer technologies scale, filter, and seamlessly translate the surgeon's hand movements into precise micro-movements of the *da Vinci* instruments. The primary advantage of the system is high definition 3D visualization, flexibility with complex instrument movements in tight spaces, and the ability to access areas of aerodigestive tract without incisions or splitting the mandible. This has the potential to reduce surgical morbidity and provide better patient functional outcomes.

The UNC Robotics Program is currently seeing patients for selected head and neck cancers, tongue base related obstructive sleep apnea, and skull base tumors. Future research plans involve expanding robotic indications for skull base surgery and merging other technologies with the robotic interface. For patient referrals, call Laura Lyndon-Miller at the Head and Neck Oncology Program at 919-966-9717.

Intuitive surgical da Vinci Robotic Surgical System



Intraoperative view of robotic base of tongue resection

Malawi: The Warm Heart of Africa

by Jessica Smyth, MD; Carol Shores, MD, PhD; and Carlton Zdanski, MD

On a clinic day, Dr. Zdanski takes time between patients to teach two of the residents, Dr. Gift Mulima (left) and Dr. Rahim Ibrahim.

Word of the arrival of "Dr. Carol" spread quickly at Kamuzu Central Hospital (KCH) and our clinic was filled Monday morning with expectant faces. Landlocked Malawi ranks among the world's most densely populated and least developed countries. Its 15 million people are served by four major hospitals, one of which is KCH, located in the capital city of Lilongwe. There is only one otolaryngologist in Malawi; consequently, it is a rare opportunity to find a surgeon who is able to treat some of the problems more unique to our specialty. Dr. Arturo Muyco, the chair of the Surgery Department, was well aware of this fact and notified the district hospitals that Dr. Carol Shores would bring two cleft surgeons with her – Dr. Carlton Zdanski and Dr. Krishna Patel. We set up our makeshift clinic in a conference room and evaluated the assembled patients, some who had been awaiting our arrival for months. Our operating room schedule filled quickly.

Although there is a recognized need in Malawi for otolaryngologists, as well as surgeons from a multitude of specialties, short-term trips are not the most effective method to fill this void and herein lay our true objective. KCH established a surgical residency program one year ago and our goal was to teach these residents – Gift Mulima, Tiyamike Chilunjika and Rahim Ibrahim – about the principles and practice of otolaryngology. During our stay, we focused on their education. In addition to receiving a series of lectures from Dr. Zdanski and Dr. Patel, they were actively involved in all of the operative cases. They quickly assimilated the information and by the end of our stay, Gift was able to perform a cleft lip repair.

We had the opportunity to manage several vascular malformations in children. This included the use of propranolol in a severely disfiguring hemangioma in a one-year-old child, which required the compounding of the drug. Thanks go out to Jenn Zanation who assisted us in directions for compounding from here in the states. The residents from KCH inform us the child is dramatically improved. This also points to the wonderful advantages presented by this unique opportunity which allows us to work with clinicians who live and work in-country and who can provide continuing care, follow-up, and help managing potential complications.

Dr. Zdanski also brought a set of pediatric esophagoscopes, bronchoscopes, and endoscopic foreign body forceps with him as a very generous donation from the Karl Storz Company. During our trip, three children presented with foreign body aspiration. Dr. Zdanski was able to teach techniques to the residents and clinical officers to successfully manage the foreign bodies in all of the children. Proper cleaning and care of the equipment was taught as well. At the end of the trip, the equipment was left at KCH where it will significantly improve the ability of the Malawian clinicians to better manage this common problem.

In addition to airway, cleft, and vascular malformation cases, we had the opportunity to operate on neck masses and an unfortunate case of Noma. We were able to impart new anesthetic management techniques, such as the use of local epinephrine and spontaneous ventilation during foreign body removal. We even got opportunities to share our technique for mastoidectomy – we performed two with headlights (camping headlights, that is), mallets, chisels, and curettes. Thankfully, we had brought our loupes for the clefts.

Dr. Zdanski demonstrates airway endoscopy as a clinical officer takes a look through the scope. The endoscopy equipment was generously donated by Karl Storz GmbH & Co. KG.

Prior to this trip, we were able to collect and send $20,000 worth of books for the resident library and medical equipment for the theater (operating rooms) and wards thanks to the generous donations of many of you. Additionally, we collected money to provide each of the residents with a laptop computer. Each resident voiced their sincere thanks, as their access to computers had been very limited and this would be a valuable tool to their continued education.

On the trip to Malawi, Dr. Smyth read a book titled, "The Boy Who Harnessed the Wind," by William Kamkwamba. This is a fantastic snapshot of the life of a man raised in this Malawi. One synopsis stated, "Much more than a memoir, this is a snapshot of life as a precocious teenager in contemporary Africa, and an affirmation of the notion that talent, beauty, and brilliance are distributed in equal measure around the world, even if opportunity is not. This is a story that hums with the excitement of an individual who, like the continent where he was raised is poised for greatness." It is our mission to continue to provide opportunities and training for these residents, the talent and future of Malawi.

We sincerely thank all of you who have shown interest in this endeavor and also for your continued support. Plans are already in the works for return educational trips to Malawi with Drs. Shores, Zdanski, and Patel. It is our goal to have a sustained continuing surgical educational presence in otolaryngology/head and neck surgery at KCH. If you wish to donate to the education of the residents at KCH, and the new class who will start July 2010, we have a fund established. Please contact Holli Gall, Major Gifts Officer, at (919) 843-5734, or holli_gall@med.unc.edu.

Future Otolaryngologists Gain Significant Research Experience in Fitzpatrick Lab

by Thomas A. Suberman and Adam P. Campbell

Since 1999, the Fitzpatrick lab has been a place for residents and medical students to gain significant research experience. Although the projects have changed through the years, the guidance of Dr. Doug Fitzpatrick has remained constant. Currently, both Adam Campbell and Thomas Suberman are taking a year away from medical school to devote to research with Drs. Fitzpatrick , Oliver Adunka, and Charles Ebert.

Left to right: Tom Suberman, Doug Fitzpatrick, PhD; Oliver Adunka, MD; and Adam Campbell

Tom: I grew up on a farm several miles from the UNC campus, attending local public school, then Carolina Friends School, and UNC, before graduating from Skidmore College. I then went on to Columbia University's postbaccalaureate program, where I completed premed coursework while working and volunteering in hospitals around New York City. I moved back to Chapel Hill for medical school thinking that I would pursue a career in psychiatry. But that changed during my third year clerkship in Otolaryngology when I discovered, during a radical neck dissection with Dr. Shockley, that I loved surgery. I realized the field of ENT would allow me to work with patients in acute and long-term settings, as well as collaborate with physicians who were as concerned with their patients and research as they were about one another. After the clerkship ended, I created a month-long elective to research minimally invasive pituitary surgery under Drs. Charles Ebert and Brent Senior. I then received the year-long T32 NIH training grant which has enabled me to spend this year working under Drs. Fitzpatrick and Adunka, as well as to continue my clinical work with Dr. Ebert.

Adam: I was raised in Charlotte, North Carolina, and completed my undergraduate work at Vanderbilt University. I first became interested in Otolaryngology after hearing Dr. Craig Buchman's lecture on cochlear implants during my first year of medical school. Subsequently, I spent the next summer working with Dr. Buchman and Dr. Adunka building the pediatric cochlear implant database under the T32 training grant. I continued to work on this database for the next two years, at which point I received a departmental training grant to spend a year working with Drs. Fitzpatrick and Adunka. Currently, I am continuing to use the pediatric database to evaluate the correlation between endolymphatic duct and sac size and degree of hearing loss in patients with large vestibular aqueduct syndrome.

Under the tutelage of Drs. Fitzpatrick and Adunka, our primary project has been the development of an intracochlear recording system that will allow surgeons to assess intracochlear trauma during cochlear implantation. This is important, as studies have shown that cochlear trauma and electrode malpositioning can lead to decreased speech perception in cochlear implant recipients. To develop this technology, we have been using an animal model to define electrophysiologic patterns of damage caused by electrode interaction with intracochlear structures. Ultimately, this system could reduce intracochlear damage, maximize hearing preservation, and improve patient outcomes.

So far, our research efforts have been very fruitful. We both presented at the Midwinter Meeting of the Association for Research in Otolaryngology in Anaheim, California, for which we each received a travel award. We are currently preparing multiple manuscripts for publication and have been accepted to present our work at the Combined Otolaryngology Societies Meeting in Las Vegas, Nevada, this April.

In addition, we have been working on a number of other projects. With Drs. Fitzpatrick and Cant (Duke University), we are helping to map the medial geniculate body of the gerbil thalamus. We are also training rabbits to distinguish between vowel sounds in order to determine if sounds can be discerned with patterned electrical stimulation of the midbrain. Finally, continuing the long legacy of allergy experiments at UNC, we are working with Drs. Ebert and Jiri Prazma to determine whether bacterial infections in rats prime the middle ear for future otitis media.

This year of research has been wonderful, and none of it would be possible without the incredible mentorship of Drs. Fitzpatrick, Adunka, and Ebert. The dedication that the Department demonstrates to research and medical students is truly astounding. During this year, we have learned to develop questions, present our results and write manuscripts and skills that will undoubtedly assist us in our future academic careers.

What Ever Happened to.... Dr. John Emmett?

When I first met Dr. Newton Fischer, I remember him looking at me and saying, "Um, what makes you so special?" My reply was simply, "I don't know…I just want to do head and neck surgery." I received Dr. Fischer's blessing to train me at UNC after a long interview (or was it an interrogation?). In July 1974, I joined none other than Dr. Harold "Rick" Pillsbury and Dr. Henry "Harry" McDonald as first year residents in Otolaryngology/Head and Neck Surgery. Rick impressed me with his enthusiasm and boundless energy. Harry was soft spoken with a quick smile and a down home sense of humor. It was a real pleasure to work with both of these individuals as we shared duties at the bottom of the residency totem pole.

Dr. Newton Fischer and Dr. Paul Biggers were master teachers with each one having a distinct approach to training residents. These two individuals were two of the most intelligent and amazing people I have ever met. Dr. Fischer always demanded the very best out of each of us, and rightly so. He led by example and was at times a stern taskmaster, but there was no doubt that the well being of each resident and their family was of paramount importance to him. When Dr. Fischer was in deep thought, he oftentimes would reach over his head with his right arm to scratch the left side of his head. All of us caught ourselves doing the same thing after a while! Dr. Fischer was and still is a true renaissance man. His love of the art and science of medicine is matched by his love of music, literature and especially gardening. During my years with Dr. Fischer, each resident, sooner or later, had a vegetable garden, even if the "garden" was a lone tomato plant in a pot outside of their house.

My residency years were enlivened by frequent invitations to the Fischer's home and to the home of Dr. Biggers, the latter of whom had a bodacious sense of humor. These events were unique occasions for all of us, each one of which developed a personality of its own. The sign beside the Biggers' mailbox actually read "The Biggers Funny Farm". Their get-togethers usually included cook-outs with lots of suds and lots of talk. Things were a bit more formal at the Fischer's home, but always fun. The food was always delicious and was accompanied by conversation that ranged over a wide variety of topics. Undoubtedly, I was attending one of these affairs when I first met Amelia as a young lady. She entertained us, if I remember correctly, by playing the harpsichord. The Division of Otolaryngology was indeed one big extended family.

Dr. John Emmett, on the far right, with his family. His oldest daughter Kathleen is beside him, with her husband Mike Filosa. Beside Mike is Dr. Emmett's wife Karen, and on the left end is daughter Susan.

On a more personal note, I became "hooked" on otologic surgery after my first procedure using an operating microscope. During my second year of residency at UNC, I struck up a correspondence with Dr. John Shea in Memphis, concluding with me spending three weeks at the Shea Ear Clinic. At the end of the three week period Dr. Shea offered to train me for a year in his Fellowship Program, only later to switch that offer to join him as an associate. Those early years were an interesting period in otology, with visitors arriving almost on a daily basis from all over the world to observe Dr. Shea in the operating room. After I joined Dr. Shea, UNC residents came to Memphis for a 2-4 week rotation for a number of years. Rick, I should probably start saying Dr. Pillsbury at this point, joined us for a few months before going to Zurich to train with Dr. Ugo Fisch.

In 1998, Greg Staffel and his lovely wife, Marian, visited us at the Shea Clinic. One thing lead to another and all of us at the Shea Ear Clinic feel very fortunate that Greg made the decision to join us in practice. Greg has built a very strong practice centered around nasal and sinus procedures, as well as facial cosmetic surgery.

My wife Karen and I celebrated our 30th wedding anniversary last October. We have two daughters. My oldest daughter, Kathleen, graduated from University of Georgia majoring in Journalism. Our younger daughter, Susan, did her undergraduate years at Princeton and will graduate from Duke Medical School this spring. She will we be entering a residency program in Otolaryngology/Head and Neck Surgery in June 2010.

The Department of Otolaryngology/Head and Neck Surgery at UNC has a very special place in my heart. Dr. Newton Fischer, as charged by his mentor at Johns Hopkins, Dr. Crow, has trained many of the much needed otolaryngologists in the state of North Carolina. As the torch was passed, Dr. Pillsbury took up a new charge to train the very finest academicians for our specialty. To Dr. Pillsbury's credit, nearly every major training program in our nation sits beneath a patch of blue sky – Carolina blue sky.

Since John Emmett left UNC, he has served as President of the Memphis Society of Otolaryngology – Head & Neck Surgery, President of the Tennessee Society of Otolaryngology – Head & Neck Surgery, and President of the Tristate (GA, AL, TN) Society of Otolaryngology. He has served as Secretary, and later as Vice President, of the Southern Section of the Triological Society. He has been President of Otosclerosis Study Group, and President of the Centurion's of the Deafness Research Foundation. He is a member of the Otologic Society, Neurologic Society, and Triological Society. Every year since 1996 he has been selected as one of the "Best Doctors" in America. He has performed over 15,000 otologic procedures.

Announcements

(Just a few of the many exciting things happening in our Department)

The annual meeting of the Newton D. Fischer Society will be held on Saturday, June 5th, in Chapel Hill. Dr. Austin Rose is the Course Director and promises an outstanding program. They keynote speaker is Gerald Healy, MD, Professor of Otolaryngology and Laryngology at Harvard Medical School and Otolaryngologist-in-Chief and Surgeon-in-Chief at The Children's Hospital in Boston. The last day to register is May 21st. Contact Dawn Wilson (dawn_wilson@med.unc.edu or 919-966-8926) for information.

The Pediatric Otolaryngology Fellowship Program is entering its second year. After a very successful beginning, Dr. Alisha West will serve as our next fellow following Dr. Laura Rosenthal's departure for Loyola University in Chicago. "We know Alisha well from her great work as a resident here at UNC and are thrilled at the opportunity to continue working with her as she continues her training at the fellowship level," said Dr. Austin Rose, Director of the Pediatric Otolaryngology Fellowship Program.

Dr. Craig Buchman was invited faculty at the Medical College of Georgia's Temporal Bone Course. This course for both residents and practicing otolaryngologists took place in February. Dr. Buchman gave two talks: "The Chronic Ear" and "Cochlear Implants in Children." He was also an invited faculty presenter at the Midwinter Meeting sponsored by the Department of Otolaryngology of the University of Colorado. His two talks were "Electroacoustic Stimulation in Adults" and "Round Window Stimulation in Adults." He also served on the "Cochlear Implantation" panel.

Dr. Adam Zanation has pioneered a new surgical procedure for minimally invasive cancer surgery reconstruction. Dr. Mihir Patel, a T32 research track resident, has been working in Dr. Zanation's lab and wrote a paper on the outcomes of this novel reconstructive technique for skull base cancer patients. This was published in the prestigious journal *Neurosurgery* in March, 2010. The paper, entitled "Pericranial flap for endoscopic anterior skull-base reconstruction: clinical outcomes and radioanatomic analysis of preoperative planning," was co-authored by third-year resident Dr. Rupali Shah with Dr. Zanation as the senior author.

The Southern States Rhinology Course was held April 8-10 at Kiawah Island, South Carolina. This course for practicing otolaryngologists and residents provided a comprehensive update on the medical and surgical practice of rhinology. A hands-on laboratory dissection component featured state-of-the-art endoscopic instrumentation, video, and image guidance systems. The distinguished faculty of academic otolaryngologists from the southeastern United States included our own Dr. Brent Senior.

A future otolaryngologist interested in craniofacial research, Gitanjali Madan won the Harold C. Pillsbury Award (First Place) for her basic science poster presentation, "Umbilical Cord Derived Mesenchymal Stem Cells Demonstrate Robust Osteoinduction and May Be an Ideal Source for Tissue Engineered Bone," at the John B. Graham Student Research Day on January 27, 2010. This same poster won Second Place for Outstanding Medical Student Poster at the American College of Surgeons Clinical Congress in October 2009. Ms. Madan works in the lab of Dr. John van Aalst (Department of Surgery, Division of Plastic and Reconstructive Surgery), and they have been collaborating with Dr. Amelia Drake (Chief of the Division of Pediatric Otolaryngology and Director of the UNC Craniofacial Center) on a clinical project that will be presented at COSM in April. Dr. Jake Dahl will spend 6 months in his second year of residency working in this lab to continue the project. Ms. Madan is currently doing research as a Howard Holderness Distinguished Medical Scholars Research Fellow and will begin her fourth year of medical school after the Fellowship. She is also the Wolfgang and Daisy Losken Craniofacial Research fellow for the 2009-2010 academic year. After medical school, she is interested in pursuing a residency in Otolaryngology.

Dr. Adam Zanation was invited faculty at the University of Nebraska Sinus Course in Vail, Colorado, March 10-12, as well as invited faculty at the University of Pennsylvania Medical Center Skull Base Course, March 16-19. He was also selected to the 2010 American Academy of Otolaryngology-Head and Neck Surgery CORE Grant Review Committee.

Dr. Carol Shores was awarded two grants for research projects in Malawi. The $50,000 North Carolina TraCS grant is for the project entitled "Comorbid Infections and Cancer in Malawi." NC TraCS is the academic home of the NIH Clinical and Translational Science Award (CTSA). The Study Section concluded: "This project is of great potential in that (1) it is a first step in developing a cancer registry for Malawi, (2) extends a strong existing collaborative research infrastructure, (3) opens up new and exciting research collaborations for UNC cancer researchers and (4) might serve as a platform for highly fundable research projects." Dr. Shores has also received funding from the University Cancer Research Fund for "Cancer Database and Tissue Procurement in Malawi" in the amount of $11,923.

Dr. Brent Senior returned to Asia this year for three meetings and mission work. In February he was invited faculty for "The 7th Annual Middle East Update in Otolaryngology Conference and Exhibition" in Dubai, United Arab Emirates. Next he went to Manila, Philippines, for "The International Symposium on Functional Endoscopic Sinus Surgery." In March, he returned to Vietnam, as he does every year, first for the "New Trends in Rhinology Practice" meeting in Ho Chi Minh City, and then on to Hanoi for his mission work there with REI Vietnam. (More about this trip in the annual report!)

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Laura Rosenthal, MD, Pediatric Otolaryngology Fellow

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