

2008 ANNUAL REPORT

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

Research: The Foundation for Outstanding Patient Care



Alisha N. West, MD; Jeffrey B. LaCour, MD; and Robert A. Buckmire, MD

THE DEPARTMENT OF OTOLARYNGOLOGY HEAD AND NECK SURGERY



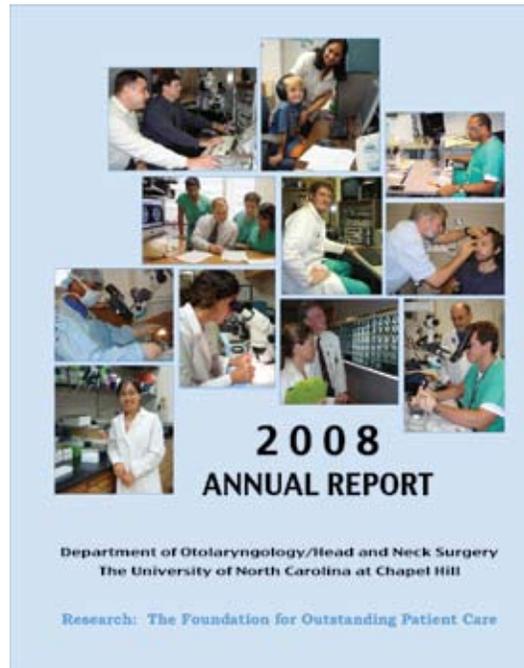
2008

ANNUAL REPORT

**The University of North Carolina School of Medicine
Chapel Hill, North Carolina**

About the Cover

The cover of this year's annual report features some of our faculty, residents, and staff who are committed to advancing the field of Otolaryngology/Head and Neck Surgery through innovative research. Research is the foundation for the first objective of our mission: to provide excellent patient care that can serve as a national model.



From top left to right:

Jaime Mancilla, PhD, and Paul B. Manis, PhD

Madhu Dev with 5-year-old Ethan, a participant in a hearing study

Robert A. Buckmire, MD

Mihir R. Patel, MD; Adam M. Zanation, MD; Joshua B. Surowitz, MD; and Rupali N. Shah, MD

Joseph P. Roche, MD

John H. Grose, PhD, with a man participating in a hearing study

Mitchell R. Gore, MD, PhD

Eveleen Randall, medical student doing research in the Manis lab

Marion E. Couch, MD, PhD; and Mark C. Weissler, MD

Craig A. Buchman, MD; and Oliver F. Adunka, MD

Xiaoying Yin, MD

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Local photography, layout, and graphic design by Elizabeth Perry.

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INTRODUCTION

A Message from the Chair

Harold C. Pillsbury, MD



As you will see from this annual report, times are ever changing in healthcare as well as in our specialty. We embarked upon a very successful Strategic Planning Meeting this past month in which we got together all members of our department including residents, faculty, research personnel, clinic personnel, and administrative personnel. In assessing what we hoped to accomplish in this meeting, and in fact what we did accomplish, it is clear that while our roles are evolving in this academic medical center, our mission has not changed. We are still committed to research, education, and patient care. It seems that the most fragile part of what we do is education, followed by research. There will always be a need for patient care, but the resources available for education and research are continually in jeopardy.

The reason for the cover on this annual report is that we continue to be committed to research with full knowledge that only by maintaining that commitment, will we be able to fulfill our mission as leaders in Academic Medicine. We have never wavered from supporting individuals performing meaningful research, whether or not they had full support from external sources. What this means is that we sacrifice a certain amount of our resources to support the things that we think are important, mainly education and research.

It is also wonderful to know that we have added Dr. Adam Zanation to our faculty as a rhinologist and endoscopic skull base surgeon. Adam finished a prestigious fellowship at the University of Pittsburgh where he did such an outstanding job. He had six presentations at the COSM meeting this past spring. Dr. Esa Bloeden joins us from the Thomas Jefferson training program in Philadelphia as a new faculty member at Wake Med.

As I write this, I am in our new departmental office in the Physicians Office Building across from the new North Carolina Cancer Hospital. For the first time since I have been here, we are all in the same location. Secretaries, clinical and research faculty, and residents are all in the same location. The interaction has proved nothing but fabulous for us.

We have also added a Pediatric Otolaryngology fellowship to our training program, which will be an excellent opportunity for an outstanding individual to receive expansive training in Pediatric Otolaryngology.

Another of our important missions is outreach. We extend ourselves to individuals in the State of North Carolina and throughout the United States as well as on an international basis. We invite people here from all over the world to be educated on the latest techniques applicable to our specialty. It is gratifying to hear their endorsement of our department based on their experiences with us. We recently graduated our last resident taken on behalf of the LSU Medical Center to train after the Katrina disaster of 2005. Each of these residents went on to do fellowships and enhance their capacity to care for the patients of Louisiana after their return. Each of us feels honored to have participated in their education.

In reviewing our plans for the immediate future, we anticipate adding two new head and neck surgeons, another rhinologist, a nurse practitioner for Pediatric Otolaryngology, and a Pediatric Otolaryngology fellow who will start next July. These additions will allow us to optimize patient care.

There is no question that our future looks bright. The upcoming election will not change our mission, but may provide challenges in our capacity to deliver on our goals. We are committed to meeting those challenges and moving to fulfill our mission to provide optimal healthcare to our patients as well as furthering the education research objectives for our department.



Faculty at the Strategic Planning Meeting in August, 2008. Front row: Robert Buckmire, Austin Rose, Carolyn Brown, Holly Teagle, Pat Roush, John Grose, Adam Zanation, Oliver Adunka, Esa Bloedon. Top row: Mark Weissler, Doug Fitzpatrick, Amelia Drake, Bill Shockley, Rick Pillsbury, Brent Senior, Paul Manis, Craig Buchman, Mike Ferguson, Emily Buss, Joe Hall.

THE UNC SCHOOL OF MEDICINE

A Message from the Dean

William L. Roper, MD, MPH



To be the Nation's leading public school of medicine is not just a lofty statement. It is a very real promise to our students and the people of North Carolina.

At UNC we continually renew our dedication to fighting disease and illness that plague the people of our state, including obesity, diabetes and cancer. The new University Cancer Research Fund, with an annual \$50 million budget, will help us promote discovery, innovative prevention, care and delivery by providing screening and prevention throughout the state.

By reaching out to Charlotte and Asheville we hope to increase the medical school's rolls from 160 to 230 to address the growing problem of physician shortages, especially in areas of our state that need it most.

We are extremely proud of both the laudable teaching efforts that our professors make in our clinics and lecture halls, as well as the hard work our students put into their academic study and clinical skills each and every day.

As teachers and clinicians, our faculty and staff are clearly preparing our students for a lifetime of achievement. I want to thank them for their knowledge and for providing our students with the tools they need to succeed and become excellent doctors.

I commend our faculty and staff for exemplifying our Vision and Values – making them a real promise and commitment to our students, our patients and our state.

Our Vision:

To be the nation's leading public school of medicine.

Our Mission:

Our mission is to improve the health of North Carolinians and others whom we serve. We will accomplish this by achieving excellence and providing leadership in the interrelated areas of patient care, education, and research.

Patient Care

As a key component of the UNC Health Care System, the School of Medicine will provide superb care to North Carolinians and others whom we serve. We will maintain our strong tradition of reaching underserved populations. Excellence in education and research will enhance our delivery of the very best medical care, which will be presented in an environment that is exceptionally welcoming, collegial, and supportive both for those receiving and those providing the care.

Education

We will achieve excellence in educating tomorrow's health care professionals and biomedical researchers by providing exceptional support for outstanding teaching and research faculty. We will offer an innovative and integrated curriculum in state-of-the-art facilities. The School will attract the very best students and trainees from highly diverse backgrounds.

Research

We will achieve excellence in research and in its translation to patient care by developing and supporting a rich array of outstanding research programs, centers, and resources. Proximity to the clinical programs of UNC Hospitals, to UNC-Chapel Hill's other premier health affairs Schools (Dentistry, Nursing, Pharmacy, and Public Health) and the other departments, schools, and programs on the UNC-Chapel Hill campus affords an exceptional opportunity for innovative, world-class research collaborations.

In all of these missions, we will strive to meet the needs of our local, state, national, and global communities.

Fall 2005

THE DEPARTMENT

Mission Statement

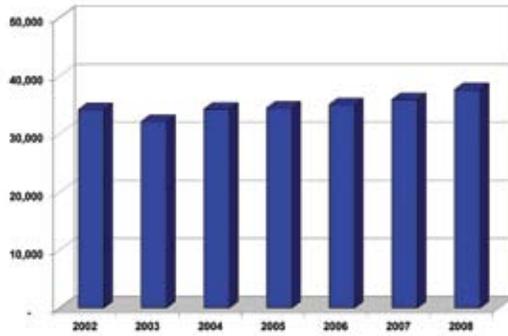
The Mission of the Department of Otolaryngology/Head and Neck Surgery is to improve health care by enhancing the field of Otolaryngology/Head and Neck Surgery and by advancing its clinical applications. To fulfill this Mission, our objectives are the following:

1. To provide excellent otolaryngologic/head and neck surgical patient care that can serve as a national model.
2. To provide outstanding undergraduate and postgraduate education that disseminates otolaryngology/head and neck surgery knowledge and facilitates more contributions to the knowledge base.
3. To carry out basic science, clinical, and health services research that advance the field of otolaryngology/head and neck surgery.

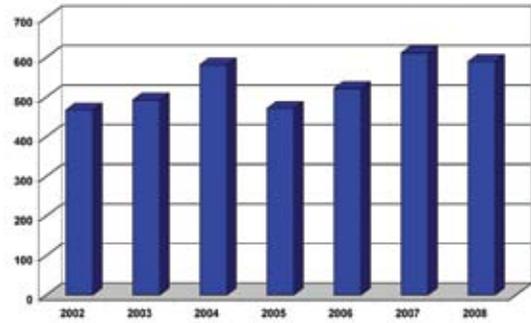


Drs. Mark Weissler and Keith Ladner

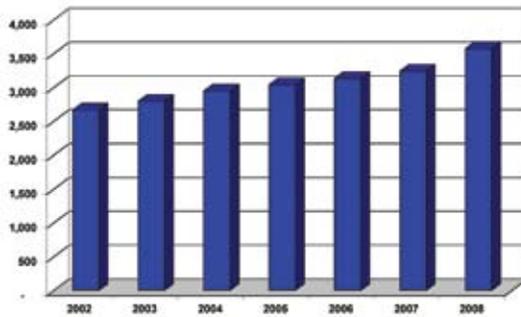
Outpatient Visits



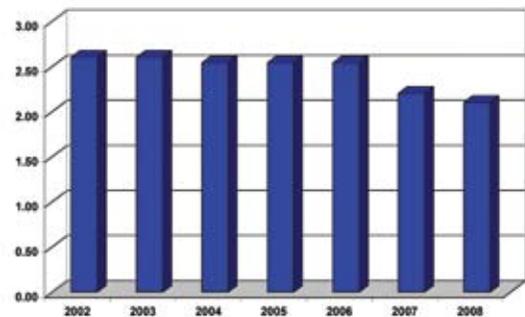
Inpatient Admissions



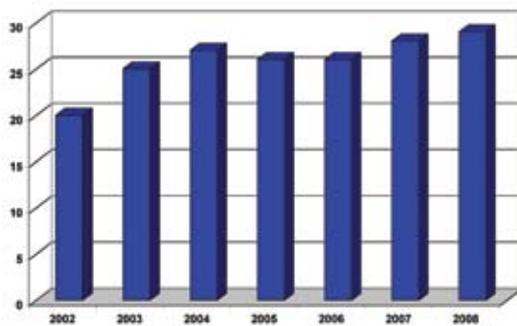
OR Cases



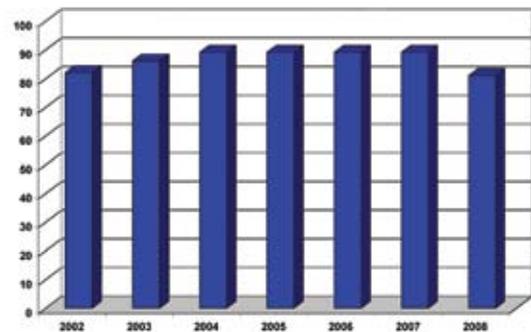
Grant Funding



Faculty Members



Staff Members



Administration

Harold C. Pillsbury, MD, FACS (Department Chair)
William W. Shockley, MD, FACS (Department Vice Chair)
Carolyn H. Hamby (Clinical Academic Department Administrator)

The Division of Facial Plastic and Reconstructive Surgery

William W. Shockley, MD, FACS (Chief)
Raymond D. Cook, MD (WakeMed ENT)

The Division of Head and Neck Oncology**Head and Neck Cancer Research**

Mark C. Weissler, MD, FACS (Chief)
William W. Shockley, MD, FACS
Carol G. Shores, MD, PhD, FACS
Marion E. Couch, MD, PhD, FACS
Xiaoying Yin, MD
Adam M. Zanation, MD
Andrew F. Olshan, PhD
Brian Kanapkey, MA
Sean Gallagher, RN
Susan Hayden, RN

The Division of Otolaryngology/Neurotology and Skull Base Surgery**The Ear and Hearing Center**

Craig A. Buchman, MD, FACS (Division Chief, Center Director)
Harold C. Pillsbury, MD, FACS
Oliver F. Adunka, MD

The Division of Pediatric Otolaryngology

Amelia F. Drake, MD, FACS (Chief)
Carlton J. Zdanski, MD, FACS
Austin S. Rose, MD

The Division of Rhinology, Allergy, and Sinus Surgery

Brent A. Senior, MD, FACS, FARS (Chief)
Adam M. Zanation, MD
Brett E. Dorfman, MD (WakeMed ENT)
Michael O. Ferguson, MD (WakeMed ENT)
Esa A. Bloedon, MD (WakeMed ENT)

The Division of Voice and Swallowing Disorders**The UNC Voice Center**

Robert A. Buckmire, MD (Division Chief, Center Director)
Mark C. Weissler, MD, FACS
Ellen S. Markus, MA, CCC-SLP, DMA
Linda F. Hube, MS, CCC-SLP

The Division of Auditory Research

Joseph W. Hall, PhD (Chief)
Jiri Prazma, MD, PhD
Paul B. Manis, PhD
John H. Grose, PhD
Emily Buss, PhD
Charles C. Finley, PhD
Douglas C. Fitzpatrick, PhD
Patricia A. Roush, AuD

The Division of Research Training and Education

Paul B. Manis, PhD (Chief)
Joseph W. Hall, PhD
Jiri Prazma, MD, PhD
Paul B. Manis, PhD
John H. Grose, PhD
Emily Buss, PhD
Charles C. Finley, PhD
Douglas C. Fitzpatrick, PhD

W. Paul Biggers Carolina Children's Communicative Disorders Program

Craig A. Buchman, MD, FACS (Medical Administrative Director)
Harold C. Pillsbury, MD, FACS (Executive Director)
Carlton J. Zdanski, MD, FACS
Oliver F. Adunka, MD
Carolyn J. Brown, MS, CCC-SLP/A (Program Director)
Holly Teagle, AuD, CCC-A (Clinical Director)

The Adult Cochlear Implant Program

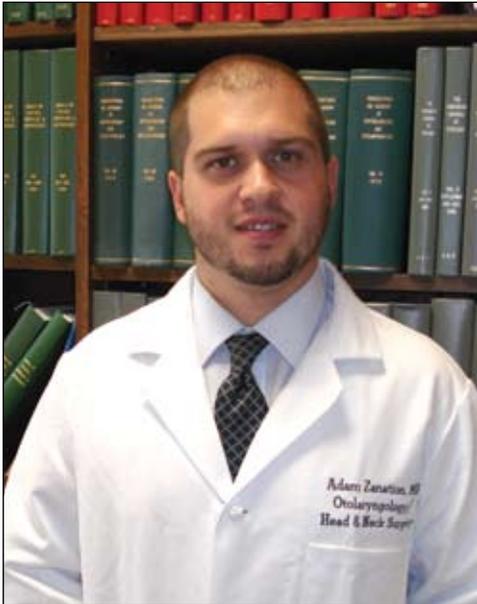
Marcia Clark Adunka, AuD, CCC-A (Director)
English R. King, AuD, CCC-A (Clinical Audiologist)

Sleep and Snoring Surgery

Brent A. Senior, MD, FACS, FARS
Marion E. Couch, MD, PhD, FACS



NEW FACULTY APPOINTMENTS



Adam M. Zanation, MD, is a fellowship-trained clinical and surgical specialist in the field of Skull Base Oncology and Surgery. He earned his MD with highest honors in 2002 from the University of North Carolina School of Medicine. He completed residency training in Otolaryngology/Head and Neck Surgery at UNC in 2007. He then went on to complete a fellowship in Skull Base Surgery and Skull Base Oncology at the University of Pittsburgh Medical Center.

Dr. Zanation began his appointment as Assistant Professor on July 7, 2008. His practice is dedicated to the diagnosis and treatment of head and neck and skull base tumors, incorporating minimally invasive and endoscopic technologies, while prospectively evaluating outcomes and quality of life in patients treated with these methods.



Esa A. Bloedon, MD, earned his MD with honors (*magna cum laude*) from Thomas Jefferson Medical College in Philadelphia. He then completed his residency training in Otolaryngology at Thomas Jefferson University Hospital. Dr. Bloedon began his practice in Otolaryngology on July 22, 2008, at WakeMed Faculty Physicians ENT-Head and Neck and Facial Plastic Surgery, joining Drs. Ferguson, Dorfman, and Cook.

Dr. Bloedon's clinical interests are broad, but he particularly enjoys the areas of thyroid and parathyroid disease, rhinology, and otology. His research interests include the pathophysiology of otitis media, specifically the role of pepsin in otitis media, and sentinel lymph node biopsy in the head and neck employing lymphosonography.

THE FACULTY



Harold C. Pillsbury, MD, FACS, Professor and Chair
Thomas J. Dark Distinguished Professor of
Otolaryngology/Head and Neck Surgery
Executive Director of the W. Paul Biggers, MD, Carolina
Children's Communicative Disorders Program
MD: George Washington University
Residency: University of North Carolina School of
Medicine
Special Interests: Otology, neurotology, skull base
surgery, head and neck tumors, cochlear implantation



Oliver F. Adunka, MD, Assistant Professor
MD: Medical University of Vienna, Austria
Residency: J. W. Goethe University, Frankfurt, Germany
Fellowship (Otology/Neurotology and Skull Base Surgery):
UNC Department of Otolaryngology/Head and Neck
Surgery
Special Interests: Otology, neurotology, lateral skull base
surgery, acoustic tumors, cochlear implants, hearing
preservation



Esa A. Bloedon, MD, Assistant Professor
Otolaryngology/Head and Neck Surgery, Wake Medical
Center
MD: Thomas Jefferson Medical College, Philadelphia, PA
Residency: Thomas Jefferson University Hospital
Special Interests: General otolaryngology, thyroid and
parathyroid disease, rhinology, otology



Carolyn J. Brown, MS, CCC-SLP/A, Assistant Professor
Program Director, W. Paul Biggers, MD, Carolina
Children's Communicative Disorders Program
MS (Speech Language Pathology): Indiana State University
Master's Equivalent in Audiology: University of Illinois
Special Interests: Cochlear implantation in profoundly
deaf children, development of spoken language in children
who are deaf and hard of hearing



Craig A. Buchman, MD, FACS, Professor
Chief, Division of Otolaryngology/Neurotology and Skull Base
Surgery
Medical Administrative Director, CCCDP
MD: University of Florida
Research Fellowship (Otolaryngology): University of
Pittsburgh School of Medicine, Children's Hospital of
Pittsburgh
Residency: University of Pittsburgh School of Medicine
Fellowship (Otolaryngology/Neurotology and Skull Base Surgery):
House Ear Institute and Clinic, Los Angeles
Special Interests: Otolaryngology/neurotology and skull base
surgery, cochlear implantation



Robert A. Buckmire, MD, Associate Professor
Chief, Division of Voice and Swallowing Disorders
Director, UNC Voice Center
MD: University of Virginia School of Medicine
Residency: University of North Carolina School of Medicine
Fellowship (Laryngology): Vanderbilt University Voice
Center
Special Interests: Voice and swallowing disorders,
diagnostic laryngeal EMG, laryngeal framework surgery,
microsurgical treatment of laryngeal pathology



Emily Buss, PhD, Associate Professor
MS, PhD (Psychology): University of Pennsylvania
Post-doctoral Research Fellowship (Psychoacoustics):
University of North Carolina at Chapel Hill
Special Interest: Psychoacoustics



Raymond D. Cook, MD, Assistant Professor
Otolaryngology/Head and Neck Surgery, Wake Medical
Center
MD: University of North Carolina School of Medicine
Residency: Duke University Medical Center
Fellowship (Facial Plastic and Reconstructive Surgery):
Tampa, Florida
Special Interests: Facial rejuvenation, reconstruction of
local scars and skin cancers



Marion E. Couch, MD, PhD, FACS, Associate Professor
MD: Rush Medical College
PhD: Rush University
Residency: Johns Hopkins University School of Medicine
Special Interests: Head and neck surgical oncology, thyroid
surgery, surgical airway management, microvascular free
tissue transfer reconstruction



Brett E. Dorfman, MD, Assistant Professor
Otolaryngology/Head and Neck Surgery, Wake Medical
Center
MD: Emory University School of Medicine
Residency: Duke University Medical School
Special Interests: Rhinology, allergy, sinus surgery



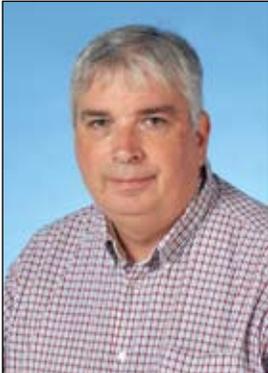
Amelia F. Drake, MD, FACS, Professor
Newton D. Fischer Distinguished Professor of
Otolaryngology/Head and Neck Surgery
Chief, Division of Pediatric Otolaryngology
Director, UNC Craniofacial Center
MD: University of North Carolina School of Medicine
Residency: University of Michigan
Fellowship (Pediatric Otolaryngology): Cincinnati
Children's Hospital
Special Interests: Pediatric otolaryngology, pediatric airway
disorders



Michael O. Ferguson, MD, Assistant Professor
Otolaryngology/Head and Neck Surgery, Wake Medical
Center
MD: University of North Carolina School of Medicine
Residency: University of North Carolina School of
Medicine
Special Interests: Rhinology, allergy, sinus surgery,
pediatric otolaryngology, and head and neck oncology



Charles C. Finley, PhD, Associate Professor
BSEE: Georgia Institute of Technology
PhD (Neurobiology): University of North Carolina at
Chapel Hill
Special Interests: Speech processor, electrode systems
and mathematical models in cochlear implants, variability
in cochlear implant outcomes, patient assessments
for advanced fitting and device validation; biomedical
engineering



Doug D. Fitzpatrick, PhD, Assistant Professor
PhD (Anatomy): University of North Carolina at Chapel Hill
Special Interest: Neuronal bases of sound localization
performance



John H. Grose, PhD, Professor
MSc: University of Southampton, United Kingdom
PhD (Audiology): Northwestern University
Special Interest: Psychoacoustics



Joseph W. Hall, PhD, Professor
Chief, Division of Auditory Research
MS (Audiology): University of North Carolina at Chapel Hill
PhD (Experimental Psychology): University of North Carolina at Greensboro
Special Interests: Clinical psychoacoustics, cochlear implantation



Paul B. Manis, PhD, Professor
Chief, Division of Research Training and Education
PhD (Neuroscience): University of Florida
Fellowship (Neurobiology): Vanderbilt University School of Medicine
Special Interests: Cellular basis of auditory information processing; central nervous system plasticity



Andrew F. Olshan, PhD, Professor
Chair, Department of Epidemiology, UNC School of Public Health
MS, PhD (Epidemiology): University of Washington
Special Interests: Molecular epidemiology of head and neck and childhood cancer



Jiri Prazma, MD, PhD, Professor
MD: Charles University, Prague, Czechoslovakia
PhD (Physiology): Czechoslovak Academy of Sciences
Residency: Charles University, Prague, Czechoslovakia
Special Interest: Inflammation of the middle ear, nose, and larynx



Austin S. Rose, MD, Assistant Professor
MD: University of North Carolina School of Medicine
Residency: University of North Carolina School of Medicine
Fellowship (Pediatric Otolaryngology): Johns Hopkins University School of Medicine
Special Interests: Pediatric otolaryngology, reconstructive airway surgery, chronic ear disease



Patricia A. Roush, AuD, Assistant Professor
Director of Pediatric Audiology
MA (Audiology): University of Iowa
AuD: University of Florida
Special Interests: Pediatric audiology



Brent A. Senior, MD, FACS, Associate Professor
Chief, Division of Rhinology, Allergy, and Sinus Surgery
MD: University of Michigan
Residency: Boston University and Tufts University
Fellowship (Rhinology and Sinus Surgery): University of Pennsylvania Medical Center
Special Interests: Sinus surgery, rhinology, allergy, sleep disorders, snoring



William W. Shockley, MD, FACS, Professor, Vice Chair
W. Paul Biggers Distinguished Professor of
Otolaryngology/Head and Neck Surgery
Chief, Division of Facial Plastic and Reconstructive Surgery
MD: Indiana University
Residency: University of Cincinnati
Fellowship (Head and Neck Surgical Oncology): Methodist Hospital, Indianapolis, Indiana
Special Interests: Facial plastic and reconstructive surgery, head and neck tumor surgery



Carol G. Shores, MD, PhD, FACS, Associate Professor
PhD (Biochemistry): University of North Carolina at Chapel Hill
MD: University of North Carolina School of Medicine
Residency: University of North Carolina School of Medicine
Special Interests: Detection of micrometastasis, study of gene expression in radiation and chemotherapy resistance, and development of novel therapies for head and neck cancer



Holly Fryauf-Bertschy Teagle, AuD, Assistant Professor
Clinical Director, W. Paul Biggers, MD, Carolina Children's Communicative Disorders Program
MA (Audiology): University of Iowa
AuD: University of Florida
Special Interests: Cochlear implant outcomes in children, focusing on device efficacy and clinical management issues



Mark C. Weissler, MD, FACS, Professor
Joseph P. Riddle Distinguished Professor of Otolaryngology/Head and Neck Surgery
Chief, Division of Head and Neck Oncology
MD: Boston University
Residency: Harvard University
Fellowship (Head and Neck Oncologic Surgery): University of Cincinnati
Special Interest: Head and neck tumor surgery



Xiaoying Yin, MD, Assistant Professor
MD: Xi'an Medical University, Xi'an, China
Residency (Pathology): Xi'an Medical University, Xi'an, China
Fellowship (Pathology): University of Pittsburgh
MS (Molecular Biology): University of Pittsburgh
Special Interests: Cancer cachexia, tumor vaccines in head and neck cancer



Adam M. Zanation, MD, Assistant Professor
MD: University of North Carolina School of Medicine
Residency: University of North Carolina School of Medicine
Fellowship (Skull Base Oncology, Rhinology): University of Pittsburgh Medical Center
Special Interests: Skull base tumors, otology, neurotology, rhinology, sinus surgery



Carlton J. Zdanski, MD, Associate Professor
MD: University of North Carolina School of Medicine
Residency: University of North Carolina School of Medicine
Fellowship (Pediatric Otolaryngology): Children's Hospital of Pittsburgh
Special Interests: Pediatric otolaryngology, research in the mechanisms of hearing and hearing loss



The lobby of the North Carolina Children's Hospital



Second year resident Dr. Maher Younes, with Ruth Debritto, RN, during his 6-month WakeMed rotation

WakeMed Faculty Physicians ENT-Head and Neck and Facial Plastic Surgery

Four physicians who hold faculty appointments in the UNC Department of Otolaryngology/Head and Neck Surgery practice in Raleigh at WakeMed. They are Michael O. Ferguson, MD; Brett E. Dorfman, MD; Raymond D. Cook, MD; and Esa A. Bloedon, MD. Starting in the fall, Carol G. Shores, MD, PhD, a long time member of the UNC ENT Department, will be transitioning her practice full time to join the WakeMed group.

WakeMed Faculty Physicians ENT-Head and Neck and Facial Plastic Surgery is the only Otolaryngology/Head and Neck Surgery group serving an 800-bed hospital and level one trauma center to offer 24 hours a day, 7 days a week coverage for ENT and facial trauma. In addition to the four attendings on staff, the UNC residents also spend 4-6 months per year at WakeMed during their second, third and fourth years of residency. The WakeMed rotation serves as the residents' true introduction to the clinical experience, and approximately 25% of their surgical volume comes from their time at WakeMed.

In the fall of 2005, Dr. Ferguson took over as the Director of the group and his clinical interests focus on pediatric otolaryngology, sinus diseases, endocrine surgery and

head and neck cancer. Dr. Dorfman's areas of expertise include pediatric and adult ENT problems, including ear disease, nasal and sinus surgery, and voice disorders. Dr. Cook specializes in facial plastic and reconstructive surgery, including facial rejuvenation and reconstruction of local scars and skin cancer. Dr. Bloedon just completed his residency training at Thomas Jefferson in Philadelphia. He brings with him a breadth of excellent training, which he will apply to his burgeoning practice of general otolaryngologic care. Dr. Shores will continue her thriving head and neck oncology practice, providing care for the patients of Wake County and beyond.

Currently our practice maintains two office settings for patient care. Our office at the main campus of WakeMed continues to provide care for the entire spectrum of patients, including the care of the indigent and our ever growing population of Spanish-speaking patients.

Starting in January of 2003, our practice expanded its scope to include the opening of an additional office space at WakeMed North, a state-of-the-art ambulatory surgery center with full radiology and laboratory services on site. That office has proven to be an invaluable part of the growth and performance of our practice, and we have successfully marketed ourselves to a previously untapped patient population for WakeMed. Over 90% of the patients seen at WakeMed North are either insured or self-pay cosmetic patients. Our referral patterns from the private community were previously unheard of for a WakeMed Faculty Physician practice and we have initiated the model that has been quickly reproduced in other areas of our multi-specialty group in an attempt to match our obvious success.

To make an appointment with one of the WakeMed ENT physicians, please call (919) 350-1630 or (919) 350-2800.

Photos by Dr. Michael Ferguson.



The newest addition, Dr. Esa Bloedon



Secretary Sandra Rudd, "the glue of the operation," per Dr. Ferguson.

THE STAFF

Employees as of October 1, 2008

Carolyn Hamby, Clinical Academic Departmental Administrator
Holly Gall, Director of Development

Administrative Academic Affairs

Jonna Apple
Kathy Bogie
Ellen Doutt
Cheryl Goodrich
Kathy Harris
Dawn Wilson
Donna Woodard
Laura Yurco

Nursing Staff (UNC Healthcare)

Samylia Alston, CNA
Nicole Baucom, Assistant to Nurses
Diane Burden, CNA
Claire Culberson, RN
Sherry Egodo, CNA
Barbara Esterly, RN
Elaine Hinkle, RN
Lynda Lucas, RN
Judy Miles, RN
Cynthia Nabut, RN
Patricia Perry, CNA
Shelvy Riley, CNA
Soon Young Rondinelli, RN
B.J. Squires, RN
Regina Stoffel, RN
Jori Thomas, RN
Margarette Ward, RN
Kara Willette, NP

Research Affairs

Madhu Dev
Shana Jacobs
Sara Mamo
Heather O'Donohue
Steve Pulver
Lisa Whittle

UNC P&A (UNC Healthcare)

Kelen Beacham
Clara Frye
Karen Kenion
Patricia Longest

Patient Business Associates

Wendy Boyd
Crystal Curasi
Earlene Howze
Angel Jeffries
Lesonia Mason
Juliette Olivares
Elaine Ray
Nicole Sharpe
Brenda Vernon
Sandra Yates

Surgery Schedulers

Anna Bradshaw
Jennifer Fennell

CCCDP

Lisa DiMaria
Deb Hatch
Robert Humphreys
David Perry
Jennifer Woodard

CASTLE (Durham Location)

Hannah Eskridge
Sandra Hancock
Tom Page
Lori Parker
Cynthia Poole
Erin Thompson
Sherri Vernelson

CASTLE (Wilmington Location)

Meagan Evans
Francisca Hernandez-Collins
Marcelo Nascimento



Anna Bradshaw, one of our surgery schedulers



Jennifer Fennell schedules the surgery for a patient who needs revision cochlear implantation



Shelvy Riley, CNA; Diane Burden, CNA; and Claire Culberson, RN



At the ENT clinic at Carolina Pointe: Barbara Esterly, RN; Judy Miles, RN; and Elaine Hinkle, RN



One of our newest employees, Sherry Egado, CNA



Administrative Staff: Ellen Doult, Kathy Harris, Dawn Wilson, Kathy Bogie, Donna Woodard, Jonna Apple, Cheryl Goodrich, Laura Yurco, Elizabeth Perry

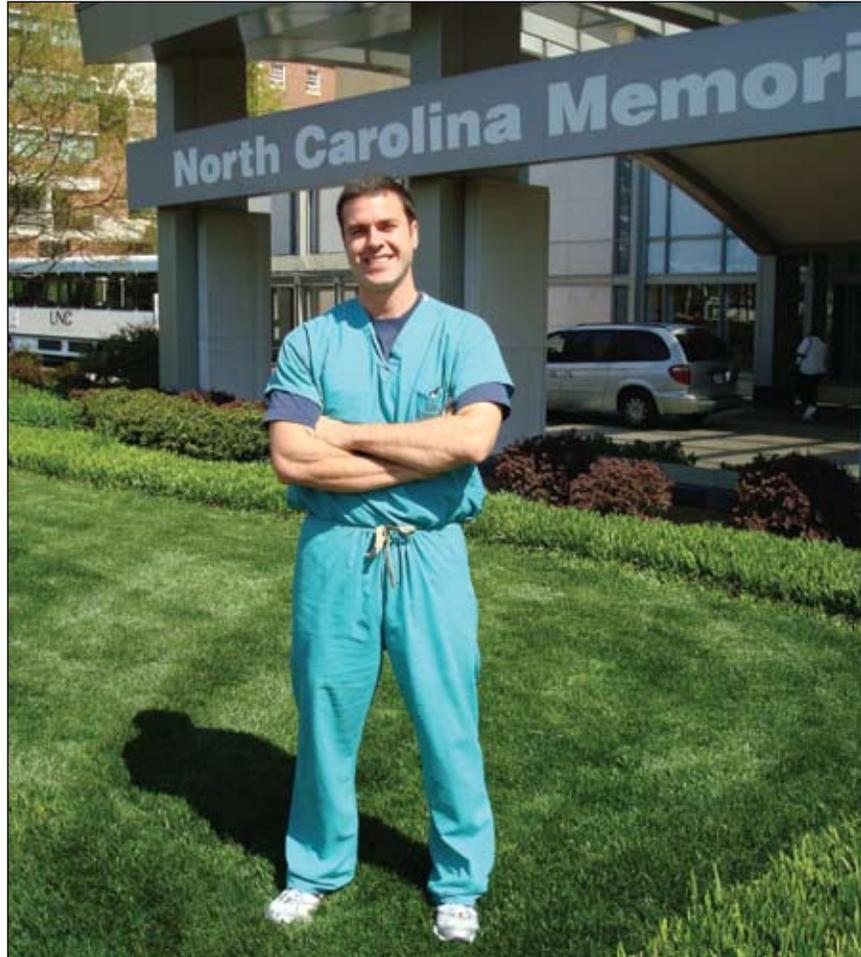


Cynthia Nabut, RN; Elaine Hinkle, RN; Nicole Sharpe, CNA; Jori Thomas, RN



Patient Business Associates: Juliette Olivares, Crystal Currasi, Elaine Ray, and Sonya Mason.

THE RESIDENTS



“ I have been around some of the best otolaryngologists and leaders in the field here at UNC. I have become a better doctor just by being around them. I have developed an appreciation for research and a desire to provide the same quality of teaching to future residents. When I see professors such as Dr. Shockley studying and learning new techniques, I realize that complacency must be avoided.”

Jeffrey B. LaCour, MD



Gregory J. Basura, MD, PhD (2010)

BS/BA (Zoology, Psychology): Albertson College of Idaho, 1994
PhD (Anatomy, Cell Biology): Wayne State University, 1999
MD: University of Washington, 2005



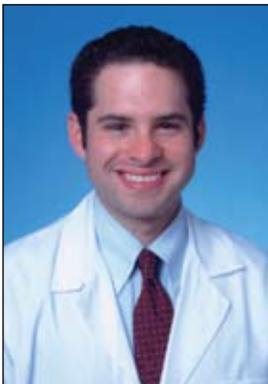
Karen A. Bednarski, MD (2008)

BA (Biology, Hispanic Studies): Northwestern University, 1998
MD: University of Iowa, 2003



Deidra A. Blanks, MD (Research Track, 2011)

BS (Biology): East Carolina University, 2000
MD: Brody School of Medicine (ECU), 2004



Paul C. Bryson, MD (2009)

BS (Biology): Denison University, 2000
MD: University of Pittsburgh School of Medicine, 2004



Trinitia Y. Cannon, MD (Research Track, 2010)

RN: St. Joseph's Hospital School of Nursing, 1995
BS (Biology): Lemoyne College, 1999
MD: University of Rochester School of Medicine, 2003



Joshua C. Demke, MD (2008)

BS: Brigham Young University, 1998
MD: Texas Tech School of Medicine, 2003
Residency (General Surgery): University of Kentucky, 2003-04



Rose J. Eapen, MD (Research Track, 2012)

BS (Neural Science): New York University, 2001
MD: Duke University Medical School, 2005



Charles S. Ebert, MD, MPH (Research Track, 2009)

BA (Spanish, Political Science): UNC-Chapel Hill, 1992
Universidad de Sevilla, Spain, 1990-1991
MPH (Epidemiology): UNC School of Public Health, 2002
MD: UNC School of Medicine, 2002



Mitchell R. Gore, MD, PhD (2011)

BS (Chemistry): UNC-Chapel Hill, 1999
PhD (Chemistry): UNC-Chapel Hill, 2004
MD: UNC School of Medicine, 2006



Paula J. Harmon, MD (2011)

BS (Biology): Spelman College, 2000
MD: Morehouse School of Medicine, 2006



Jeffrey B. LaCour, MD (2008)

BS (Biology): UNC-Chapel Hill, 1998
MD: Louisiana State University, 2003
Residency: Louisiana State University, 2003-2005



Keith M. Ladner, MD (2010)

BS (Economics): University of Washington, 2001
MD: University of Colorado School of Medicine, 2005



Steve C. Lee, MD, PhD (2008)

BS (Zoology): Andrews University, 1994
PhD (Biochemistry): Loma Linda Graduate School, 2001
MD: Loma Linda University School of Medicine, 2003



W. Derek Leight, MD (2009)

BS (Cognitive Science): University of California-San Diego, 1999
MD: UNC School of Medicine, 2004



Allen F. Marshall, MD (2009)

BS (Biology): Davidson College, 1997
MD: UNC School of Medicine, 2004



Kibwei McKinney, MD (Research Track, 2015)

BA (Human Biology, Spanish): Stanford University, 2001
MD: University of Pennsylvania, 2008



Mihir R. Patel, MD (Research Track, 2013)

BA (Chemistry, Philosophy): Duke University, 1997
MD: UNC School of Medicine, 2006



Joseph P. Roche, MD (Research Track, 2014)

BA (Biology): St. Mary's University of Minnesota, 2002
MD: Medical College of Wisconsin, 2007



Scott A. Shadfar, MD (2013)

BS (Biochemistry, Chemistry): Oklahoma City University, 2003
MD: University of Oklahoma College of Medicine, 2008



Rupali N. Shah, MD (2012)

BS/BA (Microbiology, Political Science): Univ. of Georgia, 2003
MD: Emory University School of Medicine, 2007



Jessica A. Smyth, MD (2013)

BS (Chemistry): United States Military Academy, 2000
MD: Uniformed Services University of the Health Sciences, 2004
Residency (General Surgery): San Antonio Uniformed Services Health Education Consortium, 2005
Physician: Aerospace Medicine, Kuwait and Pope AFB, 2005-08



Michael E. Stadler, MD (2011)

BS (Biology): University of Wisconsin at Madison
MD: University of Wisconsin Medical School, 2006



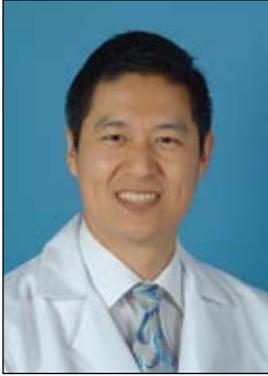
Joshua B. Surowitz, MD (2012)

BS (Biomedical Engineering): University of Miami, 2000
MD: UNC School of Medicine, 2007
Research Fellow: UNC Dept. of OHNS (NIH Funded): 2006-07



Alisha N. West, MD (2010)

BS (Neuroscience, Psychology): University of California-San Diego, 1999
MS (Neuroscience): University of California-San Diego, 2001
MD: University of California-San Diego, 2005



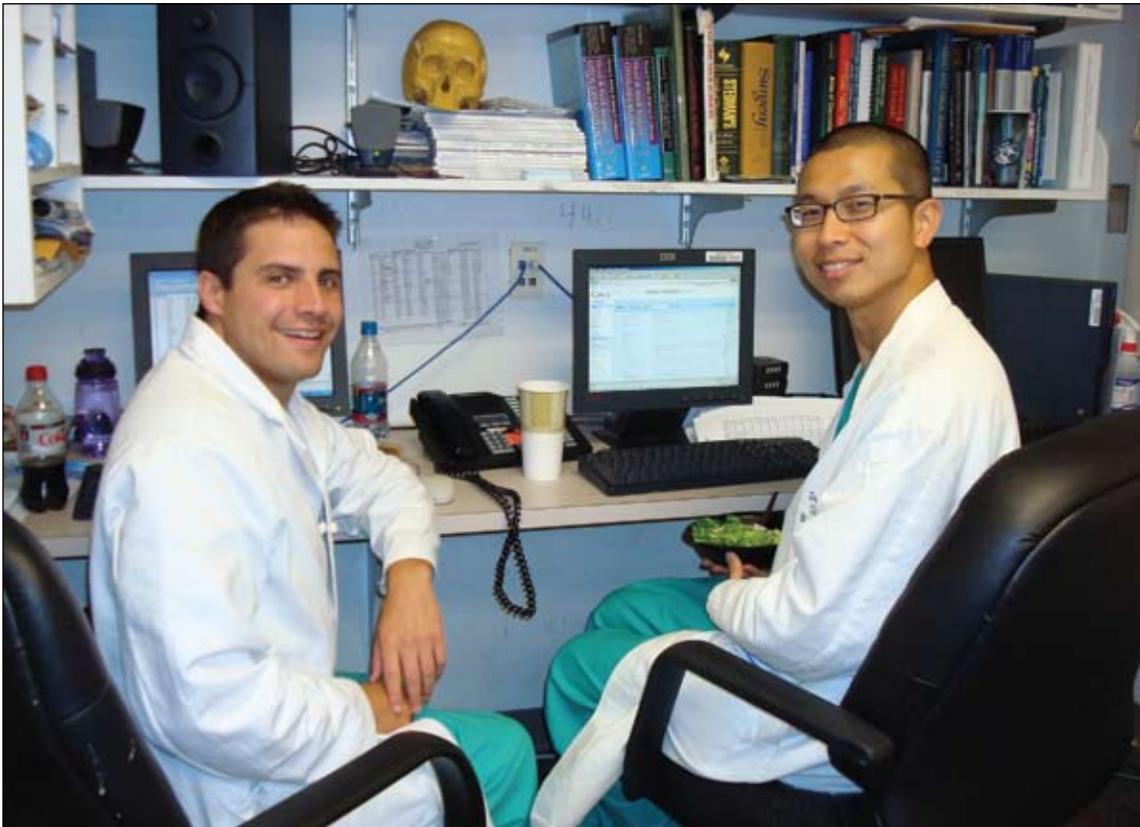
Yu-Tung Wong, MD (2013)

BS (Engineering): Harvey Mudd College, 1996
MS (Engineering): Harvey Mudd College, 1997
Pre-Med: University of California-Irvine, 2004
MS (Applied Anatomy)/MD: Case Western Reserve University
School of Medicine, 2008



Maher N. Younes, MD (2012)

BS (Biology): American University of Beirut, 1997
MD: American University of Beirut, 2001
Postdoctoral Research Fellowship (Head and Neck Cancer): MD
Anderson Cancer Center, University of Texas, 2002-2007



Drs. Keith Ladner and Steve Lee take a lunch break in the residents' room.

EDUCATIONAL PROGRAMS

The Department of Otolaryngology/Head & Neck Surgery offers numerous educational programs to residents and medical students.

Medical Students

First-year medical students are provided a two-week intensive course in head and neck anatomy. This involves a series of one-hour lectures and includes three, four-hour afternoon sessions, including three-dimensional dissections of the head and neck, as well as multiple radiologic demonstrations. Clinical faculty members from around the state also participate in these demonstrations, donating time from their practice. This rounds out the students' experience in head and neck anatomy and has been very well received over the years.



Dr. Ameila Drake, Director of the Residency Program, with Dr. Joshua Surowitz

During the second year of medical school, the *Special Senses Course* is offered to medical students over a ten-week period during the fall semester. Mechanisms of disease are emphasized, covering a spectrum of diseases, disorders, and problems encountered in Otolaryngology/Head and Neck Surgery. This section of the curriculum is presented in coordination with the curriculum of Neurology and Ophthalmology. Small group sessions focus on case studies, differential diagnosis, and treatment options. Additionally, second-year medical students participate in physical diagnosis sessions in the OHNS Clinic over an eight-week period. During this time, the basics of the physical examination of the head and neck are taught by the faculty and residents.

In the third year, there are approximately 90-100 medical students rotating on the OHNS service. During this time, students attend clinics with OHNS faculty and gain exposure to operative procedures. Students make rounds each morning and are responsible for keeping up with assigned patients. At the beginning of the surgical rotation, all third year students participate in a soft tissue course entitled *Soft Tissue Laboratory: Principles and Techniques of Wound Closure*. The OHNS residents and



First year residents: Drs. Jessica Smyth, Yu-Tung Wong, Scott Shadfar, and Kibwei McKinney

faculty serve as instructors as the fundamentals of suture techniques are introduced to the students.

During the fourth year of medical school, approximately ten acting interns rotate through the OHNS service throughout the year. This constitutes a high level of activity and responsibility, with the involvement of all the housestaff and attending faculty. Many of these students apply for residency positions in OHNS throughout the country.

Residency Program

Dr. Amelia F. Drake serves as the Director of the Residency Program. Her responsibilities include implementing the six clinical competencies, as per ACGME guidelines, as well as ensuring the smooth transition of the residents through their specialty training.

A curriculum of lectures is followed that spans the academic year. In addition, the residents coordinate a dissection lab over the summer of commonly-performed procedures. Finally, most residents participate in outside educational meetings. The third year residents attend the North Carolina/South Carolina Otolaryngology meeting, the fourth year residents attend a temporal bone course, and fifth year residents attend the annual meeting of the American Academy of Otolaryngology-Head & Neck Surgery.

Responsibilities

The residency program in Otolaryngology/Head and Neck Surgery is



Dr. Paula Harmon

structured to have four residents for five years of Otolaryngology/Head and Neck Surgery. The first year, the intern year, includes six months of General Surgery, E.R., Anesthesiology, OHNS, and Surgery Intensive Care. Second-year residents participate in six months at Wake Medical Center in Raleigh, and six months of research in the OHNS laboratories. A rotation in Audiology is incorporated into the research block. The third and fourth-year house officers spend three months each at Wake Medical Center in Raleigh as well.



Drs. Joshua Surowitz, Rupali Shah, Paul Bryson, and Carlos Ebert, with the Residency Program Coordinator, Ellen Douff.

The clinical program consists of graduated responsibilities for residents at each level. Senior residents attend either the Annual Meeting of the American Academy of Otolaryngology-Head and

Neck Surgery or the Combined Otolaryngology Spring Meeting. Most OHNS residents attend at least one other meeting during the year as scientific presenters. Upper level residents learn to balance clinical and administrative responsibilities with on-call duties and academic pursuits, such as completing publications from their basic research experiences or conducting clinical research projects.

Chief resident responsibilities include: supervising the OHNS service, organizing and distributing the educational conference schedule, and assigning residents to specific clinics, call duties and operative cases.

Resident Education

During the summer months, our residents design and coordinate a head and neck anatomy dissection course. This entails preparation and prosection of common procedures performed in OHNS. Attending physicians “take the residents through” the technical aspects of the procedure, and the discussion covers the indications, surgical options, technical highlights, and pitfalls, as well as complications associated with the procedure performed.

A Temporal Bone Course and Competition is scheduled in the spring. In addition, there are weekly conferences that include Journal Club, Head and Neck Conference, Radiology, Pathology, Patient of the Month Program, Morbidity and Mortality, Speech Pathology, Audiology, and Research Conferences. Each Wednesday morning residents present a case-based conference. The emphasis is on differential diagnosis, work-up, and management decisions. An in-depth discussion of the disease or disorder follows.

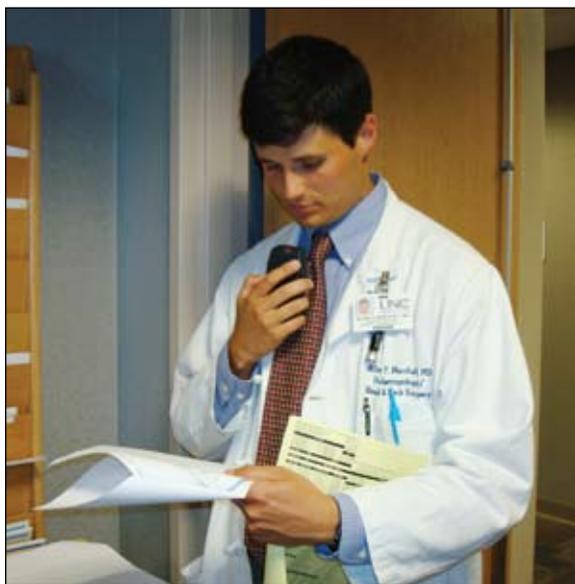


Dr. Kibwei McKinney working with Shelvy Riley, CNA, doing pre-op exams and getting patients ready for surgery

Invited guest lecturers from medical schools across the United States and abroad present a wide range of topics of both clinical and research interest. Visiting professors also participate in conferences during their visits.

One new educational opportunity has been the participation of a medico-legal course organized at Duke in which senior residents are invited to participate.

Research Opportunities



Dr. Allen Marshall dictating a clinic note

Each resident in the Department is required to design and carry out a research project during the PGY-2 year. Many have chosen to undertake projects within the established laboratories in the Department, while others have chosen to work in related disciplines such as microbiology, molecular biology, tumor biology, audiology, or cochlear physiology. The Department also has affiliations with the Dental Research Center and the Department of Anatomy and Cell Biology. The quality of resident research has been consistently high, resulting in numerous awards and publications.

The Department of Otolaryngology/ Head and Neck Surgery has a number of laboratories engaged in auditory and head and neck oncology research. Auditory research currently has separate laboratories engaged in human psychoacoustics, cochlear implant performance and modeling, information processing and plasticity in the auditory brainstem and midbrain, the neural basis of sound localization, and inflammatory mechanisms in viral otitis media.

Head and neck oncology research includes clinical trials involving management of patients with squamous cell carcinoma, investigation of the mechanisms and treatment of cancer cachexia, analysis of genetic mechanisms of head and neck cancer, and studies in the pathogenesis, diagnosis, treatment, and epidemiology of head and neck squamous cell carcinoma. In addition to auditory and head and neck cancer studies, research is also currently being carried out in the area of reflux, airway problems, allergies, and sinonasal disorders.



Dr. Michael Stadler at the Carolina Pointe clinic

NIH Training Grant

In 2001, the Department was awarded a 5-year grant totaling \$580,000, from the National Institutes on Deafness and Other Communication Disorders (NIDCD) for research training in Otolaryngology/Head and Neck Surgery. With the inception of this training grant, the department joined an elite group of about a dozen institutions that offer 2-year research training positions during residency. The grant also guarantees the Department's continued support and promotion of medical student research experiences at UNC. The training grant further extends the burgeoning research support within the department, by providing stipends for medical students (2 for the summers and 1 for a whole year, each year of the grant) and one resident for two years for research training each year. This grant was successfully renewed in 2007 for an additional 5 years.

This past year, we supported one medical student (Scott Asher, from University of Alabama, Birmingham, working with Dr. Marion Couch) for a very successful and productive one-year research experience. Scott worked on analysis of patterns of protein changes, using proteomic and metabolomic approaches, in a novel

immunocompetent murine model of head & neck cancer cachexia. We also supported two summer students. Our current 1-year trainees are Alex Rich and Stefan Mlot, both from UNC. Mr. Rich is working with Dr. Paul Manis on the effects of hearing loss on synaptic transmission to the stellate cells of the ventral cochlear nucleus. Mr. Mlot is working with Drs. Emily Buss, John Grose, and Joe Hall on a project investigating speech perception in patients with Ménière's disease.

Last year's short term trainees included Adam Campbell and Loan Foltz. Adam studied cochlear implant speech perception outcomes with Drs. Adunka and Buchman. Logan worked with Dr. Fitzpatrick, and studied plasticity of responses of inferior colliculus neurons as a function of behavioral state. Current summer medical student trainees (both from UNC) include Eveleen Randall, who is studying the effects of hearing loss on synaptic transmission in the dorsal cochlear nucleus in rats, and Katherine Sebastian,

who is studying plasticity of the responses of inferior colliculus neurons as a function of behavioral state with Dr. Fitzpatrick.



Dr. Mihir Patel

The 2-year research program for selected residents is also continuing to grow, with one resident having just completed the program, and two that are currently in the program. Dr. Rose Eapen, mentored by Drs. Emily Buss, John Grose, and Joe Hall, completed her training in June. One of her projects examined the hypothesis that children with histories of chronic otitis media develop abnormal strategies for processing speech wherein greater weight is given to frequency regions that are associated with more stable hearing thresholds. Another of her projects investigated speech processing in patients with Ménière's disease, examining the hypothesis that part of the speech perception difficulty experienced by these patients Ménière's is due to poor coding of the temporal fine

structure of speech, and that this is modulated with the ingestion of glycerol. Finally, Dr. Joseph Roche is beginning his 2-year research program, where he is studying spike-timing dependent plasticity in auditory cortex with Dr. Paul Manis. Dr. Roche recently received the Herbert Silverstein Otology/Neurotology Research Award, which is a jointly sponsored by the AAO-HNS Foundation and the American Neurotology Society.

This is 2-year fellowship to help support his research on synaptic plasticity and critical periods for sensory learning in auditory cortex.

The trainees have been actively submitting papers for both their basic research and in the clinical arena, as well as attending a variety of conferences to present their work. The residents in particular have also been quite successful in obtaining additional research funding for their projects, including from the Deafness Research Foundation (Dr. Ebert, a 2-year research resident), an AHNS/AAO Young Investigator Award (Dr. Patel, a 2-year research resident), Lineberger Comprehensive Cancer Center (3 grants, Dr. Cannon, a 2-year research resident), the American Academy of Otolaryngic Allergy (Drs. Ebert and Eapen in separate grants), a ROADS scholarship from AAOA (Dr. Blanks), and the Herbert Silverstein Otology/Neurotology Research Award (Dr. Roche). Additional success in the program is evident in the number of applicants from institutions outside UNC Chapel Hill, attesting to the national stature of the program and the strength of the research opportunities.



Dr. Deidra Blanks

So far, in the first 6 years, this grant has provided research support for 7 residents for 2-year research projects, 8 medical students for a 1-year research experience, and 9 medical students for a short-term (summer) research stint. The renewal of the grant allows us to continue our extensive research training experience for another 5 years. Dr. Paul Manis, the Director of Research Training and Education, is the Program Director and Principal Investigator for this grant.



Dr. Carlos Ebert will be the first resident to complete the 7-year research track.

Every year the Department invites guest lecturers from across the United States and abroad to present a wide range of topics of both clinical and research interest. These visiting professors also participate in our conferences during their visits. This year we welcomed nine exceptional speakers:

Dana Mara Thompson, MD, MS

Associate Professor, University of Cincinnati College of Medicine
Director, Adult Airway Reconstruction
Cincinnati Children's Hospital
Department of Otolaryngology-Head & Neck Surgery
Cincinnati, Ohio
Congenital Laryngomalacia
Pediatric Swallowing Disorders
October 23-24, 2007

Peter Roland, MD

Professor and Chair, Department of Otolaryngology
University of Texas Southwestern Medical Center
Director, Dallas Cochlear Implant Program
Dallas, Texas
Management of Chronic Suppurative Otitis Media
The P1 Cortical Evoked Potential in Cochlear Implant Candidates
November 13-14, 2007

Nishant Agrawal, MD

Chief Resident, Department of Otolaryngology
Johns Hopkins University Medical Center
Baltimore, Maryland
Bacteriolytic Cancer Therapy
December 7, 2007

Adam M. Zanation, MD

University of Pittsburgh Medical Center
Pittsburgh, Pennsylvania
Seeing the Light: Endonasal Endoscopic Orbital Tumor Surgery
Management of Esthesioneuroblastoma: Where Does Endoscopic Cranial Base Resection Fit In?
December 18-19, 2007

Peter Constantino, MD, FACS

Director, Center for Craniofacial Reconstruction, The Roosevelt Hospital Center
Director, Cranial Base Surgery, Department of Otolaryngology-Head and Neck Surgery,
Columbia University
New York City, New York
Open versus Endoscopic Cranial Base Surgery: When, Why and How
Management and Rehabilitation of Facial Paralysis
March 25-26, 2008



UNC Hospitals

Michael Setzen, MD, FACS, FAAP

North Shore Otolaryngology Associates, PC

Clinical Associate Professor of Otolaryngology, New York University School of Medicine
Manhasset, New York

*Rhinogenic Headache – Does the Entity Exist and What is the Role of the
Otolaryngologist?*

Transnasal Esophagoscopy: Why, When and How

April 1-2, 2008

Myles L. Pensak, MD

Chairman, Department of Otolaryngology
University of Cincinnati School of Medicine
Cincinnati, Ohio

Avoiding Complications in Otologic Surgery

Contemporary Approaches to Skull Base Lesions

April 22-23, 2008

Christine Gourin, MD

Director, Clinical Research Program in Head and Neck Cancer
Dept. of Otolaryngology-Head and Neck Surgery
Johns Hopkins University
Baltimore, Maryland

Complications of Organ Preservation Therapy

Use and Misuse of PET-CT

May 20-21, 2008

Patrick O'Brien Sheahan, MD

Medical University of South Carolina
Charleston, South Carolina

Optimum Treatment of Laryngeal Cancer in 2008

June 25, 2008

NEW DEVELOPMENTS



Some of the many members of the Airway Center team: Seated: Kathy Abode, RN; Marianne Muhlebach, MD; Carlton Zdan-ski, MD; Marianna Henry, MD. Standing: Jennifer Rayburn, SLP; Marjorie Thomas, RN; Leslie Stewart, MA; Mark Hall, RT; Amelia Drake, MD; Cynthia Reilly, NP; Cathy Tutka, LCSW; and Kara Willette, NP. Photo by Brian Strickland Photographer.

The North Carolina Children's Airway Center

The North Carolina Children's Airway Center was ranked 7th in the nation among the top 30 children's hospitals caring for children with respiratory disorders by *US News & World Report* in their 2008 issue of America's Best Children's Hospitals. The Center was awarded a grant from The Duke Endowment from 2007 to 2009 for the creation of a center to care for children with aerodigestive problems. It is a unique public private endeavor, brought into existence by funding from the Department of Otolaryngology/Head and Neck Surgery, the Department of Pediatrics Division of Pulmonology, and The Duke Endowment to provide multidisciplinary evaluation and treatment of children with complex airway and swallowing disorders. The Center seeks first and foremost to provide comprehensive cutting edge care for children with these unique problems in an efficient and timely manner. Additionally, the Center will seek to instruct families, medical students, clinicians and healthcare providers, and to perform research into pediatric airway disorders. The North Carolina Children's Airway Center officially opened its doors in September 10, 2007. In the Center's first six formative months, nearly 130 patients have been evaluated by the multi-disciplinary team, nine protocols established for the evaluation of children with airway problems, three collaborative research projects being established, three presentations at national meetings, and multiple presentations at the state and local level.

The Center's core organizational structure includes Surgical Director Carlton J. Zdanski, MD; Medical Director Marianna Henry, MD; Respiratory Therapist Mark Hall, RT; Tracheostomy Nurse Cynthia Reilly, NP; Speech Pathologists Jennifer Rayburn, SLP, and Leah Thompson, SLP; Administrative Coordinator Leslie A. Stewart, MA; Social Worker Cathy Tutka, LCSW; and Program Coordinator Kathy Abode, RN.

The North Carolina Children's Airway Center provides an individualized, coordinated approach to each patient and the full range of pediatric medical and surgical services, including anesthesia, radiology, ICU care, feeding and swallowing, nutrition, tracheostomy care, social work, respiratory therapy, speech and communication, are available to patients of the Airway Center. The clinicians at the Center have an interest in caring for all children with airway problems, including those with existing tracheotomies or with new airway problems. If you have a patient you would like to refer to the North Carolina Children's Airway Center, please feel free to contact the OHNS Clinic at 919-966-6485 and ask for Marjorie Thomas, RN, or call the Consultation Center at 800-862-6264, and request Dr. Zdanski.

Fellowship in Pediatric Otolaryngology

Over the past few years, the demand for pediatric ENT services within our Department has grown exponentially. While meeting this demand has been challenging, it has also created significant learning opportunities, both in terms of clinical experience and surgical cases. To address this need, the Department now offers a one-year Pediatric Otolaryngology Fellowship and just matched its first candidate, Dr. Laura Rosenthal, who will begin in July of 2009. Dr. Rosenthal will join us after completion of her residency at the Henry Ford Hospital in Detroit, Michigan.

"As our Division grows, I think there is a clear opportunity for excellent training at the fellow level" say Dr. Austin Rose, Director of the Pediatric Otolaryngology Fellowship Program. As home to a free-standing Children's Hospital, Pediatric Airway Center, Craniofacial Center and Pediatric Cochlear Implant Program, UNC offers many ways for pediatric otolaryngologists entering the field to get involved and expand upon their residency training.

In addition to clinical responsibilities, there will also be opportunities for research, as well as rotations in pediatric anesthesia, pediatric pulmonary medicine and pediatric genetics. With three full-time faculty and approximately 2000 cases per year in the Children's Hospital OR and Ambulatory Care Center outpatient operating rooms, the position offers a great deal of clinical and operative experience. As the only pediatric ENT fellowship in the state, the program should help to bolster the Division's position as the premier group for pediatric otolaryngology training in North Carolina.

Auditory Brainstem Implant

On July 13, 2007, Dr. Craig Buchman from the Department of Otolaryngology-Head and Neck Surgery and Dr. Matthew Ewend from the Division of Neurosurgery at UNC were the first surgeons in the United States to place an auditory brainstem implant (ABI) in to a patient without brain tumors resulting from Neurofibromatosis type 2 (NF2). This event marks the first patient implanted in the UNC-initiated clinical trial to study the safety and efficacy of the ABI in patients without NF2.



The team of professionals from the Dept. of Otolaryngology/Head and Neck Surgery involved in this ABI case at UNC: B.J. Squires, RN; Holly Teagle, AuD; Craig Buchman, MD; Marcia Clark Adunka, AuD; and John Grose, PhD. (Not pictured: Mathew Ewend, MD, from the Division of Neurosurgery)

The ABI is an implantable neural stimulator, developed in 1979 by William F. House and colleagues in Los Angeles, to treat hearing loss in patients without cochlear nerves because of NF2. Patients with NF2 have bilateral acoustic tumors and they often times lose hearing because the cochlear nerve(s) are destroyed by either the tumors or the surgery needed to treat these tumors. The ABI is placed over the cochlear nucleus of the brainstem to stimulate the auditory system deep to the cochlear nerve.

Similar to the cochlear implant, the ABI stimulates the auditory system by using electrical impulses. A microphone connected to an external speech processor collects and decodes the acoustic signal (i.e. sound) into the various component parts. This information, as a digital signal, is then delivered by radiofrequency to an internal receiver/stimulator implanted under the skin behind the ear. The stimulating electrodes exit the internal device and are placed in to either the cochlea (i.e. cochlear

implant) or directly onto the brainstem cochlear nucleus (i.e. ABI). Thus, the cochlear implant stimulates the cochlear nerve and the ABI stimulates the cochlear nucleus. Remarkably, specific electrical stimulation of the auditory system is recognized by the brain as sound. While cochlear implants have demonstrated a profound success in both adults and children with a variety of hearing losses, only preliminary evidence from Italy and elsewhere in Europe suggests that the ABI can be used safely in patients without NF2 and may provide patients with significant hearing abilities.

Mr. Hale is a 62-year-old gentleman who suffered from meningitis in 2002 and associated bilateral, total profound hearing loss. He underwent a cochlear implant surgery in 2002 but was unable to gain any benefit from the device because of scarring and bone growth (i.e. ossification) inside the cochlea. Stimulation of his cochlear implant caused significant facial twitching without any hearing. Because he was a previously normal-hearing individual, we felt that an ABI could potentially help him by delivering some auditory information directly to his cochlear nucleus, thereby bypassing his diseased cochlea. Since this was not an FDA-approved use for this device in the United States, a clinical trial was initiated with the device manufacturer (Cochlear Corporation, Englewood, Colorado) and UNC.

The surgery was carried out on July 13 through an opening in the back of the patient's skull. Undertaking an ABI surgery requires collaboration among a host of professionals from otolaryngology, neurosurgery, audiology, and industry. In the operating room, correctly placing the device requires both a detailed understanding of the anatomy by the surgeons and an ability to monitor the auditory system's responses to electrical stimulation (EABR). Following placement of the electrodes, stimulation is carried out to see if appropriate responses are elicited. If needed, minor adjustments in the position of the electrodes can then be made in an attempt to maximize success. At UNC, operative monitoring was performed by Drs. John Grose and Holly Teagle from the Department of Otolaryngology-Head and Neck Surgery.

Following recovery from surgery, Mr. Hale underwent activation of his ABI in November by a team of audiologists from the Department including Marcia Clark Adunka, AuD, and Holly Teagle, AuD. Device activation required carefully observing the patient's responses to varying levels of electrical stimulation on the different electrodes. Indeed, at activation, he was immediately able to discern sound from other effects and could hear different pitch levels.

On the day of activation, Mr. Hale could hear soft sounds on a hearing test and showed that the device could provide significant improvements in lip-reading and sound awareness. While these initial results were very encouraging to both the patient and the implant team members, hearing rehabilitation is expected to be an ongoing, long-term learning process. This is partially because his brain has been deprived of sound for more than 5 years and the ABI delivers a signal that his brain is unaccustomed to.

The patient is now 9-months post activation with his auditory brainstem implant, and he is making great strides in hearing and learning to use the implant system. The patient's ability to communicate verbally in combination with speechreading cues has increased exponentially. Mr. Hale is committed to the use and application of his device and he is "grateful for all the efforts to improve his hearing abilities". This is an exciting time for all us!



The external microphone and speech processor



The Auditory Brainstem Implant (internal receiver/stimulator and electrodes)

The UNC Skull Base Center

Historically, the complex anatomical relationships of many important structures within the base of the skull have made treatment paradigms particularly morbid for afflicted patients. Recent advances in surgical approaches, cranial nerve monitoring, endoscopic visualization, intraoperative imaging and navigation, neuroendovascular techniques, as well as intraoperative and stereotactic radiation have allowed dramatic improvements in patient outcomes and quality of life. Many of these improvements have been directly attributable to close collaborations between a variety of medical disciplines including Neurosurgery, Otolaryngology-Head & Neck Surgery, Radiation Oncology, Neurointerventional Radiology, and rehabilitative disciplines. For example, surgical approaches developed by rhinologists and neurotologists have allowed neurosurgeons access to tumors and other lesions involving the skull base without the need for traumatic brain retraction, resection, or in some instances, skin incisions. Moreover, working together, surgeons and radiation therapists have been able to apply precise anatomic knowledge to the delivery of highly focused radiation in an effort to avoid collateral tissue damage.

Skull base lesions are uncommon and clinical trials for treating many of these lesions are lacking. Patients are frequently left to seek opinions from a variety of

clinical specialists including medical and radiation oncologists as well as surgeons in an attempt to find a consensus regarding optimal therapy. However, opinions are frequently divergent and dictated by the practitioner's area of expertise rather than by patient factors. This creates significant uncertainty among both patients as well as referring physicians during difficult times.

Nationwide, there are very few dedicated skull base centers that provide a truly multidisciplinary approach to the management of such tumors. Most centers use either a "surgery-centric" or "radiosurgery-centric" model depending on the institution's expertise and interest. This institutional bias might not serve the patients' best interests. At UNC, we are fortunate to have a unique skull base program that combines professional experience and skills, cutting edge technologies and facilities, and a burning desire to provide a balanced and unbiased opinion of the treatment options that serves the patient's best interests. Cooperation through mutual respect for one another's skills and opinions forms the backbone for this eclectic treatment philosophy.

Both Neurosurgery and Otolaryngology-Head & Neck Surgery have recently added new faculty members with special interests and training in this area. Radiation Oncology has also recently added the Cyberknife Radiosurgical System to the radiation-based treatment armamentarium. This system has a dedicated nurse coordinator for patient care. The Cyberknife System has a number of distinct advantages over its competition in that it allows for precise frameless delivery of either single dose or fractionated dose radiation to tumors throughout the body including the skull base.

Dr. Craig Buchman serves as Director of the new UNC Skull Base Center. Others from the Department of Otolaryngology-Head and Neck Surgery who are directly involved include Drs. Oliver Adunka, Marion Couch, Harold Pillsbury, Brent Senior, William Shockley, and Adam Zanation, as well as nurses Barbara Esterly, RN, and B.J. Squires, RN.

Other UNC Disciplines Involved:

Neurosurgery: Drs. Matthew Ewend and Anand Germanwala

Radiation Oncology: Dr. David Morris

Endocrinology: Dr. Julie Sharpless

Ophthalmology: Drs. Syndee Givre and Jonathan Dutton

Neuroradiology: Drs. Mauricio Castillo, Valerie Jewells, Keith Smith, Sten Solander, and Benjamin Huang

Neurology: Dr. Jerry Greenwood

Medical Oncology: Dr. Neil Hayes

Nursing: Sharon Cush, RN, and Pasha Lemnah, RN

Rehabilitation: Diane Meyer, PT

UNC Human Temporal Bone (HTB) Laboratory

Tissue processing by means of conventional histology remains a cornerstone in modern medical and surgical diagnostics. In otology, histological processing has helped in the understanding of fundamental disease processes such as sensorineural hearing loss or otosclerosis.

With the advent of cochlear implants, histological methods have been used to evaluate intracochlear and neuronal tissues important for electrical stimulation of the auditory system. Specifically, investigators have looked at the spiral ganglion and its implications for successful cochlear implantation. Also, new cochlear implant technologies have been developed that allow for the preservation of residual hearing in a select group of patients. The Department of Otolaryngology/Head and Neck Surgery has been engaged and is currently leading enrollment in the North American Trial for the evaluation of the MED-EL Electric Acoustic Stimulation system. This device allows for a combination of acoustic and electric hearing and relies on the surgical conservation of residual hearing, which is typically lost after conventional cochlear implantation.



Drs. Oliver Adunka and Trinitia Cannon

The goal of hearing preservation during surgery can be achieved by using atraumatic surgical principles and special soft and shorter electrode carriers. The electrode currently in use for the EAS clinical trial has been histologically evaluated in a previous study by Dr. Oliver Adunka. Several other studies have then focused on the evaluation of other cochlear implant electrode prototypes and proper surgical cochleostomy technique.

With the help of MED-EL, the Department of Otolaryngology/Head and Neck Surgery at the UNC has now established a temporal bone laboratory, which will serve as a scientific tool to develop and evaluate new cochlear implant electrodes and improved surgical techniques. The laboratory offers a special sawing, grinding, polishing method which allows handling of un-decalcified bone and hard material; such as platinum-iridium contacts found in cochlear implant electrodes. Thus, removal of the electrode prior to histological processing is not necessary and subsequently, this technology allows for an improved evaluation of both intracochlear electrode position and resulting trauma. Several projects are currently under way and results are pending.



Drs. Mihir Patel and Carlos Ebert

OUTREACH



Dr. Rose with a young patient. Photo by Lindsay Butler.

West Bank 2008

The following article, reprinted with permission, appeared in The Carrboro Citizen, the community newspaper of Carrboro, NC, on July 31, 2008. The story, written by staff writer Rich Fowler, covers the trip to the West Bank led by UNC plastic surgeon Dr. John van Aalst along with pediatric otolaryngologist Dr. Austin Rose, dentist Dr. Bilal Saib, and dental hygienist Lindsay Butler.

UNC surgeon leads West Bank initiative

Thabet Thabet hospital sits atop a large hill in the West Bank town of Tulkarem, and on a clear day from the rooftop you can see the Mediterranean Sea only 30 miles away. But the hospital has to function without computers, microscopes, saws, drills and a lot of other equipment you would ordinarily find in hospitals in the U.S.

That hospital is where John van Aalst's mother was born.

For about 10 days every May and December, van Aalst brings a small team of medical professionals from the U.S. to Tulkarem to operate on children with cleft palates and to teach Palestinian doctors how to treat them. Van Aalst, a plastic surgeon at UNC Hospitals, has treated over 250 Palestinian children since he first came to the region in 2005. His wife, Cindy, a registered nurse who also works at UNC Hospitals, comes and assists him on his trips to the West Bank.

This May, Bilal Saib, a Chapel Hill dentist; Lindsay Butler, a dental hygienist; and Austin Rose, an ear, nose and throat surgeon at UNC Hospitals also came with van Aalst to Tulkarem. They will all take part in a presentation about their most recent trip to the West Bank at Grace Church on Sage Road in Chapel Hill this Sunday at 2:30 p.m.

“We’re operating on kids who’ve got no money,” van Aalst said.

“They have nothing,” Saib said of the people who live in the refugee camps. “Even by Palestinian standards, they’re considered second-class citizens.”

Van Aalst and Saib took donated equipment to the hospital in order to perform the surgeries. Van Aalst brought thousands of dollars of medical equipment donated by medical equipment manufacturers and Saib raised several more thousand to buy dental equipment to take over.

“I literally built a small operating room and dental facility there,” Saib said.



Dr. Rose checks a patient's ears. Photo by Lindsay Butler.

Rose said he and his colleagues performed about five to seven surgeries a day for about six days, from eight in the morning until as late as eight at night, followed by a big dinner.

“Everybody was extremely nice to us, and incredibly hospitable. It was amazing. Every night we were hosted at someone’s house for dinner, and you really got to know people,” he said.

“There are plenty of kids that really do need surgery that we can’t operate on in a given trip, and the only thing we can tell them is, ‘Next time,’” van Aalst said. “It’s a difficult decision. But it’s a little easier knowing that we are going back.”

Rose said he learned a lot from the local doctors. He worked with one doctor who had converted the driver’s seat of an old Subaru into an examination chair. “People actually get pretty ingenious when they don’t have everything that we have,” he said.

Van Aalst is emphatic about involving local doctors and wants to put himself out of a job in the West Bank.

“The goal really is that we don’t do any surgeries there without someone from the West Bank or Gaza being there or working with us,” he said. “Because [otherwise], that’s very short-sighted. What that does is it takes care of only one patient at a time. But if we train people with each of the patients that we’re operating on, then suddenly there are two, four, six, 10, 20 surgeons that can do this work, and they are the ones who’ll carry it on.”

An ‘awesome’ group

Fixing a cleft palate can take as many as 15 to 20 surgeries carefully timed over a number of years, so it’s not just a simple case of looking in on a few surgeries to figure out how it’s done. To augment training, van Aalst sets up conferences on the first Saturday of every December and specialists from around the world come to give presentations to the Palestinian Cleft Association.

Some of the training is presently taking place in Chapel Hill. Over the next few weeks, Itaf Arafat, a Palestinian speech therapist, will be learning how to treat children with cleft palates at UNC Hospitals. When she’s done, she will go back to the West Bank to teach what she has learned to her speech therapy students at Ramallah Women’s Training Center, a community college funded by the United Nations.

“I can set up my private clinic and work,” Arafat said, “but I don’t want to do that because what I’m doing now is much bigger.”

Van Aalst wants to include doctors in Gaza, but the situation there makes it difficult. “It’s an order of magnitude of difficulty greater than being involved in the West Bank,” he said, “and actually that’s part of what makes it necessary to think of Gaza and to try to include them in any plans.” He plans to set up teleconferences with doctors in Gaza so that they too can benefit from the conferences.

“This group is awesome,” Saib said. “If [John] had said China, I would’ve gone to China with him. I’m doing it because I like what John does.”

Those interested in donating can give to the Palestine Children’s Relief Fund at www.pcrf.net, the Smile Train at www.smiletrain.org or to the UNC Pediatric Plastic Surgery Research Fund.



Dr. Rose placing Pressure Equalization tubes.
Photo by Lindsay Butler



Dr. Senior performing sinus surgery in Hanoi, sharing the latest techniques with Vietnamese physicians.

Vietnam 2008

Karen A. Bednarski, MD, chief resident at the time, contributed this article to the Bulletin of the American Academy of Otolaryngology-Head and Neck Surgery after her return from Vietnam in February.

Resource exchange international (REI) is an organization which focuses on the strengthening individuals in developing countries, who then in turn, strengthen their country. The organization has been active in Vietnam for many years, organizing semi-annual trips to Hanoi and Ho Chi Minh City. This February a group of six otolaryngologists set out to Hanoi, each with different experiences and motivations, but all with the primary goal of “giving back.” Dr. Brent Senior, our group leader, was on his eleventh trip to Vietnam. He provided direction to the group as well as insight into the country’s development and changes in healthcare over the years. I joined three other American otolaryngologists as “newbies” Brian Romaneschi, M.D., Mimi Tran, M.D., and Tan Nguyen, M.D. Dr. Do-Il Kim, an otolaryngologist from South Korea, who had previously spent two years in Chapel Hill working with Dr. Senior, joined us on his second trip and created a truly multicultural group.

Each morning, after a group meeting, we went to one of four hospitals around the city. At each hospital we had the opportunity to see patients in clinic and perform

procedures in the operating room. As most patients come from far distances to see a physician in Hanoi, patients would be directly admitted to the hospital after being seen in clinic and then receive the necessary surgical intervention on the following day. The patients would then have to remain as an inpatient to receive the necessary postoperative care. It was not unusual to have two patients per bed (which can be quite confusing!). The hospital supplied very little outside of treatment with family members providing meals, wound care, medications, and any other patient needs.

The entire breadth of the field of otolaryngology is practiced in Vietnam, and the surgeons are extremely skilled. Our group was able to participate in a wide range of procedures including complex nasal reconstruction, thyroidectomy, parotidectomy, tympanoplasty, endoscopic sinus surgery and pituitary surgery. The operating rooms were well equipped, much due to REI, however many instruments were worn and difficult to use.

Afternoons were dedicated to conferences, and one in particular stands out. A teaching conference for the residents was held at the National ENT Hospital. Although standard in any training program in the United States, grand rounds and teaching conferences have only been instituted due to the influence of the REI physicians. Eleven years ago all textbooks were printed prior to 1975 and knowledge was considered private. Now there is a new exchange of knowledge and a renewed excitement for learning. That afternoon solidified the fundamental goal of this trip. By connecting with the physicians in Hanoi and returning consistently there has been a renewed dedication to education which, in turn, results in improved healthcare for all Vietnamese.



The REI team with otolaryngology residents in Hanoi.

Why I Return

by Brent A. Senior, MD

Eleven years, eleven trips, six months of my life spent in Vietnam, and the most common question asked of me is “Why?” Well, it is not simply for the frequent flyer miles!

Every physician who travels on humanitarian missions must answer this question at some time. For some, it is the sense of adventure that comes with practicing their craft in a foreign environment. For others, it is that sense of self satisfaction that comes with “doing a good deed.” Both are valid, both are good, but for me, it is far more. It is returning a little bit of the immense wealth and blessing that I have received by being raised in a wonderful country, trained in outstanding programs, and working in a fantastic university doing what I love to do in order to help people that live on meager wages with textbooks from 1975, working in squalid conditions, struggling to do what we easily achieve. It is living a life of significance and not existence. Indeed, it is living out what I believe to be true: “I will show you my faith by what I do” (James 2:18).

At dinner with a colleague recently, he summed up his life philosophy by saying “life is meant for living!” But after eleven years, I have found that it is so much more. Life is not simply meant for *living*, but real life is meant for *giving*. And that is why I return to Vietnam.





Drs. Paula Harmon and Carol Shores during excision of a massive circumferential keloid

Malawi 2008

In February of 2008, Drs. Carol Shores and Paula Harmon spent 10 days in Lilongwe, Malawi. Malawi is a country in eastern Africa that has one Otolaryngologist in the whole country. With the overwhelming need for treatment of benign ear, nose, throat diagnoses, as well as malignancies, multiple operations and procedures were performed to aid in the health disparity.

Dr. Shores has continued to maintain a surgical relationship with Kamuzu Central Hospital in Lilongwe, and has traveled to the location on three occasions. During the recent trip, multiple surgical supplies, as well as a laptop computer were donated to the Malawi surgical team.

Dr. Harmon, a third year resident, had been awarded two grants: one by the American Academy of Otolaryngology - Head and Neck Surgery (CORE grant), and another from the UNC Medical School Alumni Endowment Fund to research The Viral Response to Chemotherapy in Endemic Burkitt Lymphoma. Through the collaboration between UNC Project and Lilongwe Kamuzu Central Hospital, Dr. Harmon and her advisor, Dr. Shores, set up the proof of concept portion of the study during their visit in the summer of 2007. Their objectives were to determine whether cyclophosphamide-containing chemotherapy regimen increases lytic EBV gene expression, inducing

expression of virally encoded kinases that convert ganciclovir into its active cytotoxic form. They hypothesized that human EBV-positive Burkitt Lymphoma would respond to cyclophosphamide by increasing viral gene expression within four days of treatment.

It was found that while cyclophosphamide was effective in diminishing latently-infected tumor cells, they did not see histochemical evidence that lytic viral replication occurred in response to chemotherapy.

Further work is underway at earlier time points and using more sensitive molecular methods to detect any transient evidence of lytic viral replication that would imply potential efficacy of ganciclovir in the setting of chemotherapy for Burkitt lymphoma.

During the February mission, multiple disease processes were encountered. Examples of some of the disease processes: head and neck squamous cell carcinoma, cystic ameloblastomas, maxillary sinus osteomas, fibromas, fibrous dysplasia, malignant parotid tumors, sinus mucoceles, branchial cleft cysts, and massively deforming keloids. This short list does not begin to scratch the surface of the pathology that was present in Malawi.

Procedures were performed and included, but were not limited to: mandibulectomy, maxillectomy, sinus mucocele removal, parotidectomy, keloid removal and branchial cleft cyst excision.

Project Uplift

The Department of Otolaryngology – Head & Neck Surgery has participated in Project Uplift for the past four years. This program is sponsored by the UNC Office of Diversity & Multicultural Affairs and by the Office of Undergraduate Admissions. To promote a diverse student body, gifted high school students from minority and underrepresented populations spend two days on the UNC campus learning about UNC student life and academic opportunities. These students have demonstrated leadership within their high schools and are deemed to have strong academic potential.

To encourage these students to come to the University of North Carolina and to consider a career in medicine, our residents and Dr. Marion Couch have hosted three sessions each year. The students are shown around the hospital where our surgeons meet the students. Following the tour, a slide show and a demonstration of how to handle surgical instruments allows the students to visualize an operating room. Our residents, such as Dr. Trinitia Cannon and Dr. Deidra Blanks, describe their unique journeys that lead them to a surgical residency program. The importance of mentorship and following each person's own dream is emphasized. The students are encouraged to ask questions and the interactive sessions are well-attended.

The Carolina Covenant Mentoring Program

UNC was one of the first universities to establish a program that is now used throughout the country. In the Carolina Covenant, UNC covers all financial needs for admitted students whose family's incomes are at 200 percent of the federal poverty level or less. The students are given no special consideration for admission and are granted a Carolina Covenant scholarship only after they meet the admission criteria. But these are remarkable students as evidenced by the fact that a majority of the scholars are the first in their families to go to college. Each year, Dr. Marion Couch participates in a special program to be a faculty advisor to some of the undergraduate Covenant scholars.

To offer the students in the Carolina Covenant the opportunity to have mentors in the School of Medicine, the School of Public Health, and the Lineberger Comprehensive Cancer Center, Dr. Marion Couch and her colleagues have begun an additional mentoring program. The goal of the program is to give the undergraduate students the background information they need to make sound, successful career choices and to mentor them to achieve their goals.

Once a month, the students and physicians meet for Carolina Covenant Medicine and Science Mentoring program on campus. The program starts with some advice on how to prepare for a career in medicine and research. Topics include how to apply to medical school, what a career in medicine entails, and how to balance family and career. Questions are encouraged and after the meetings, the students are given the opportunity to shadow the physicians in their offices. Dinner is served to encourage professional networking. Dr. Bruce Cairns, Dr. Sam Jones, Dr. Matthew Ewend, Dr. Lisa Carey, and Dr. Peadar Noone are among many physicians who participate in this program.

International Visiting Physicians

Over this last year, the Otolaryngology/Head and Neck Surgery department has continued to influence and advance the field internationally by hosting a large number of visiting physicians from overseas. Traveling from Vietnam, this year the department was pleased to welcome Luong from the ENT Hospital of Hanoi for extended fellowships. Dr. Luong is the Vice-Chair of Otolaryngology/Head and Neck Surgery at the Bach Mai Hospital, the largest general hospital in Vietnam. Dr. Luong stayed about six weeks updating himself with the latest techniques in Rhinology (under Drs. Senior and Zanation). In addition, the department has welcomed Dr. Shawn Lee from South Korea, Dr. Mansingh from India, and Dr. Cong from Thailand. Drs. Lee, Cong, and Mansingh hail from private hospitals in their countries. We have recently also had the pleasure of welcoming Dr. Jae Hoon Lee from South Korea, and Dr. Tian from China for the 2008-9 academic years. It is a pleasure to have them all with us!

CLINICAL PROGRAMS



Dr. Drake with three sisters

Pediatric Otolaryngology

The Division of Pediatric Otolaryngology includes three fellowship-trained pediatric Otolaryngologists: Amelia F. Drake, MD; Carlton J. Zdanski, MD; and Austin S. Rose, MD, who share the effort of caring for the child with problems relating to the ears, nose, sinuses, upper aerodigestive tract, or neck. They see patients in the Pod #1 of the ENT Clinic in the Neurosciences Hospital, as well as at Carolina Pointe. They provide complete coverage for the pediatric patient with an otolaryngologic problem, with areas of interest ranging over the spectrum of Otolaryngology. Whether a child has a thyroid tumor or presents with complications of sinusitis, state-of-the-art care is provided. Furthermore, the North Carolina Children's Airway Center allows optimal communication of a child's airway concern over a team of providers, with excellent coordination of care for the patient.

Also, Dr. Drake's leadership as Director of the UNC Craniofacial Clinic, housed in the Dental School, has allowed patients from the entire Southeast, and as far away as Switzerland, to get their craniofacial condition optimally treated in a coordinated fashion.



Dr. Rose kids around with two of his patients, a brother and sister.



Dr. Zdanski



Dr. Shockley with a patient who rides his motorcycle to UNC from the western part of the state.

Facial Plastic and Reconstructive Surgery

Facial Plastic and Reconstructive Surgery plays an important role in the clinical care of patients and in the education of residents. Dr. Shockley, Chief of the Division of Facial Plastic and Reconstructive Surgery says “Traditionally we have focused on patients requiring reconstructive procedures. More recently we have seen a number of patients seeking cosmetic procedures. In the US and abroad there has been tremendous growth in these procedures, especially office procedures performed without incisions, scars or side effects. As a result the popularity of Botox and soft tissue fillers has soared”. Dr. Shockley at UNC and Dr. Raymond Cook at Wake Med see a broad range of patients in consultation. Many of the reconstructive procedures are focused on the treatment and reconstruction of skin cancer, facial paralysis, facial and nasal deformities, and the medical and surgical management of scars.

Dr. Shockley was one of the invited faculty members at the Portland Rhinoplasty Course in July of 2008. This reflects his interest in rhinoplasty and seeing patients who might be candidates for rhinoplasty, as well as patients with functional complaints such as nasal obstruction and nasal valve problems.

With the nationwide emphasis on health and appearance there has been a shift from the more traditional cosmetic surgical procedures to office procedures which have minimal to no side effects and no associated down time. This allows the patients to come in for a “quick fix” and be on their way. Improving access has been a major goal of the Facial Plastic Surgery Service. Dr. Shockley is now seeing patients at Carolina Pointe and Dr. Cook sees patients at Wake Med North. This has provided a more optimal environment in which to see these patients.

Many patients are referred for surgical reconstruction. At UNC, Dr. Shockley sees a wide variety of patients with defects and deformities. “I still love reconstructive surgery. Each patient presents a particular challenge and hopefully we can come up with a unique solution. Of course our goal is to restore the patient’s function and appearance to as close to normal as possible.” Dr. Shockley’s special interests include rhinoplasty, reconstruction of facial cutaneous defects, skin cancer, surgery for facial paralysis, and scar revision.

Elaine Hinkle, RN has been Dr. Shockley’s nurse for 13 years. “Elaine has played a major role in the success of the Facial Plastic Surgery Clinic. She continues to play a critical role in our entire clinical enterprise. She is adored by the patients and is one of the most respected and dedicated nurses at UNC Hospitals” says Shockley.

Dr. Raymond Cook a fellowship trained Facial Plastic Surgeon at Wake Medical Center also sees a variety of patients. His interests include both surgical and non-surgical forms of facial rejuvenation and reconstructive surgery secondary to trauma and cancer. Dr. Cook’s goal is to enhance or restore the intrinsic beauty, which is present in each individual, rather than create a result that appears “surgical.”

Dr. Cook sees his cosmetic patients in the WakeMed North office in North Raleigh. The office has recently acquired the Portrait Plasma for skin regeneration. The Portrait Plasma is the next generation of medical laser technology. Dr. Cook has had great success using the Portrait Plasma to treat multiple patients for wrinkles, fine lines, texture and imperfections in skin tone and discoloration.

From an educational standpoint there has been an expansion in the facial plastic surgery curriculum. Facial Plastic Surgery Conference meets twice a month and has been a big hit with the residents. In addition to reviewing chapters from a facial plastic surgery text, there are lectures from the UNC faculty, guest lecturers and journal clubs. Residents see patients in The UNC Facial Plastic Surgery Clinics with a broad range of disorders including: facial skin lesions, skin cancer, congenital or acquired facial and nasal deformities, microtia, facial paralysis and vascular lesions. Recently there has been a surge in patients requiring functional rhinoplasty, nasal valve problems, and esthetic rhinoplasty. Consultations are also available for those seeking facial cosmetic procedures.



Dr. Senior with a patient

Rhinology, Allergy, and Sinus Surgery

Sinusitis is one of the most common diseases occurring in the United States with nearly 36 million cases diagnosed every year. Originally established in 1979 by W. Paul Biggers, MD, and Libby Drake, RN, the Division of Rhinology, Allergy, and Sinus Surgery provides a complete range of services for management of sinus and allergy conditions. These services include the latest in medicine, immunotherapy, and surgery.

Libby Drake, RN, and Judy Miles, RN, provide full allergy service to over 300 patients a month. With the use of the multi-test 11 screen, the allergy nurses have been able to test younger children. The opening of the Carolina Pointe satellite clinic has brought unparalleled convenience, offering free parking at the front door. The allergy nurses and ENT physicians are an integral part of educating new residents about the importance of allergy treatment in the ENT practice.

Division Chief Brent A. Senior, MD, along with Adam Zanation, MD, Harold C. Pillsbury, MD, Brett E. Dorfman, MD, and Michael O. Ferguson, MD, perform a full range of minimally invasive surgery for management of diseases of the nose and paranasal sinuses, including Functional Endoscopic Sinus Surgery (FESS), a minimally invasive

technique used to restore sinus ventilation and normal function in the setting of chronic infection. More recently, advances in these minimally invasive techniques developed by UNC surgeons now allow for performance of minimally invasive surgery for many tumors of the nose and sinuses and, in some cases, those of the orbit and even of the brain. Recent technological acquisitions, including the latest in powered instrumentation and computer image guidance, aid in these techniques and provide significant advantages over traditional approaches. In addition, the division was among the first in the world to obtain and utilize intraoperative CT imaging for real-time surgical use.

As a result of the Division of Rhinology, Allergy, and Sinus Surgery's leadership in the realm of nasal and sinus disease, UNC Otolaryngology/Head and Neck Surgery was named the first recipient of a "National Center of ENT Excellence" Award in 2004 by BrainLAB, AG, of Munich, Germany, one of the world's leading image guidance technology companies.

A major activity of the Division is co-sponsorship of educational programs in rhinology and sinus surgery. For the fourth year, the Division co-sponsored the Southern States Rhinology Course at Kiawah Island, South Carolina. Jointly sponsored by the Medical University of South Carolina, the Medical College of Georgia, Emory University, and the Georgia Nasal and Sinus Institute, the course attracted over 80 participants from around the world in addition to over 30 residents. The course provided an opportunity



Dr. Senior with Dr. Sanghyun Lee, a visiting physician from Seoul, South Korea

to participate in laboratory dissections while hearing renowned rhinologists over the course of this two-day meeting.

Research is another major focus for the Division. This year, numerous residents and medical students participated in Division research activities resulting in several presentations at major national and international otolaryngologic meetings including the Annual Meeting of the AAO/HNS and the Annual Meeting of the American Rhinologic Society. Topics of division research have included aspects of minimally invasive pituitary surgery, image guidance, and basic science studies in the innate immunity of the paranasal sinus epithelium, leading to several papers submitted and published in peer-reviewed journals.

Office Based Treatments for Nasal Obstruction

Nasal obstruction has long been successfully treated with septoplasty and/or submucosal resection of the inferior turbinates. Both procedures require a visit to the Operating Room, usually with general anesthesia, and frequently with septal splints and packing. Complications of these procedures include nasal septal perforation, bleeding, infection, and following over-resection of the inferior turbinates, dry nose with persistent crusting. Radiofrequency submucosa resection of the turbinates (Nasal Somnoplasty) is a minimally invasive procedure that can be performed in the office with only topical anesthesia that avoids a trip to the Operating Room and has an extremely low incidence of side effects (bleeding). It is indicated for patients whose nasal obstruction does not relate to deflections of the nasal septum and whose turbinate enlargement is not due to bony hypertrophy. The procedure is well tolerated by patients, with no postoperative pain, and one to two treatment sessions will cure approximately 80-90% of appropriately-selected patients' nasal obstruction. Radiofrequency submucosa resection of the turbinates is an ideal procedure for patients who do not wish to have a procedure performed in the Operating Room, and whose nasal obstruction is not related to septal deflection.

Office Based Treatments for Snoring

Snoring is a ubiquitous problem in the United States, affecting more than 50% of middle aged men and 40% of middle aged women. Obtrusive snoring can be associated with more severe medical conditions, including obstructive sleep apnea, or upper airway resistance syndrome (UARS), and treatments for these disorders of sleep are needed to prevent long-term problems with heart and lung disease.

For simple snoring, not associated with OSA or UARS, radiofrequency treatment of the palate (Palatal Somnoplasty) is our procedure of choice. Now available in the

United States for about 10 years, It is a time tested office-based procedure, where a needle electrode is inserted into the palate, delivering radiofrequency energy to heat surrounding tissue. We have altered the technique to increase the amount of energy and the number of lesions given to the palate, thereby decreasing the number of treatment sessions needed to improve snoring. 70% of patients will be cured after two treatment sessions using our technique. The side effects of this procedure are minimal; however, palatal ulceration, fistula, and uvular slough have been reported. The relatively minor amount of post-procedure pain is the major advantage of this technique over other snoring therapies. And as opposed to other minimally invasive treatments, no implants are required with no risk of implant extrusion.



Barbara Esterly, RN, is the nurse who works with Dr. Senior

Obstructive Sleep Apnea Treatments

Nearly one-fourth of middle-aged men and one-tenth of middle-aged women have problems with sleep disordered breathing ranging from simple snoring to severe breathing disorders during sleep, such as obstructive sleep apnea. Obstructive sleep apnea has been associated with decreased life span, mandating diagnosis and treatment. Options for treatment provided by members of the Department of Otolaryngology/Head and Neck Surgery include the following:

Septoplasty

Septoplasty consists of removing pieces of deviated bone and cartilage from the nasal septum. Avoiding the need for packing of the nose or placement of splints makes this outpatient operation a remarkably painless procedure. For patients with enlargement of the turbinates alone and a straight septum, turbinate reduction may be all that is required.

Tongue Base Somnoplasty

(Radiofrequency Volumetric Tissue Reduction of the Tongue)

Patients with obstructive sleep apnea frequently have obstruction at the tongue base. Many procedures are available to improve this obstruction, including genioglossus advancement, hyoid suspension, mandibulomaxillary advancement, and more recently, tongue base Somnoplasty.

The tongue base Somnoplasty uses radiofrequency energy to heat tissue surrounding a small needle which is inserted into the tongue base. The heated tissue is resorbed by the body, leaving a scarring, reducing the size of the tongue base. This procedure has proven safe with a small incidence of tongue base abscesses being the primary complication. While proven effective by a few studies, tongue base Somnoplasty is a relatively new technique, and the ultimate utility of this modality is still unknown.

Uvulopalatopharyngoplasty

Uvulopalatopharyngoplasty (UPPP) involves removing the uvula and portions of the palate and is frequently combined with tonsillectomy. Significant improvement in obstructive sleep apnea (OSA) occurs in about half of all individuals undergoing the surgery.

Genioglossus Advancement

Genioglossus advancement is a procedure frequently performed for obstructive sleep apnea in the presence of blockage in the upper airway caused by the position of the back of the tongue. The procedure requires making an incision between the lower lip and the gum in the mouth. A small window of bone in the jaw is then cut and moved slightly, thereby pulling the tongue slightly forward and increasing the space in the breathing passage in the back of the throat.

Pioneering Minimally Invasive Skull Base Tumor Treatments: Minimally Invasive Pituitary Surgery (MIPS)

In March 2000, Brent Senior, MD, along with Matthew Ewend, MD of the Department of Surgery, Division of Neurosurgery, became the first team in North Carolina to perform Minimally Invasive Pituitary Surgery (MIPS) to treat pituitary adenomas. In contrast to traditional open approaches, no incisions are involved, dramatically reducing the overall morbidity of the procedure. The sphenoid is accessed directly through the nose using sinus endoscopes and is widely opened. The scope is set in position and the sella is then accessed using a typical two-handed technique. The tumor is removed using only the endoscopes, allowing for visualization at angles deep in the sella for removal of residual tumor that may otherwise be missed using microscopic approaches. Recovery is rapid and no packing is typically used. Tumor removal is more complete given the ability of the angled endoscopes to see behind and under otherwise obstructing structures. Drs. Senior and Ewend have become recognized experts in this exciting area, lecturing nationally and internationally on the topic, in addition to authoring publications in several journals. They have performed over 350 of these procedures, placing University of North Carolina at the forefront of minimally invasive approaches to skull base tumors. Dr. Adam Zanation, now joining the faculty following his fellowship in minimally invasive skull base surgery, will seek to take this exciting area to new levels for patients with a variety of skull base, brain, spine, and orbital tumors.

The UNC Multidisciplinary Head & Neck Oncology Program

The Multidisciplinary Head & Neck Oncology Program offers a full range of leading-edge diagnostic and therapeutic techniques for the treatment of all benign and malignant tumors of the Head & Neck including, but not limited to, tumors of the oral cavity, pharynx, and larynx; soft tissues; thyroid; nose and sinuses; ear and temporal bone; skull base; salivary glands; and the cerebello-pontine angle. The Program's main goal is to cure head and neck cancer while maintaining optimal speech and swallowing function and achieving the best possible cosmetic result.

The team consists of surgeons, medical oncologists, radiation oncologists, pathologists, diagnostic and interventional radiologists, dentists, epidemiologists, prosthetic specialists, nutritionists, speech and swallowing specialists, nurses, and social workers. The exchange of knowledge and opinions among team members ensures that the best possible treatment plan is developed for each patient. Each week, the Program holds an interactive conference attended by Program members from each discipline. Mark C. Weissler, MD; William W. Shockley, MD; Marion E. Couch, MD, PhD; Harold C. Pillsbury, MD; and Carol G. Shores, MD, PhD, serve as the Program's Head & Neck oncologic surgeons. This conference is also Webcast to Wilmington, NC where Head & Neck physicians participate directly and discuss their patients. Patients from Wake Med are also presented at this conference. Our weekly tumor board now routinely discusses over 30 patients per week actively undergoing multidisciplinary cancer therapy at UNC. In the fiscal year ended January of 2008 we saw a total of 2148 head and neck cancer clinic visits at UNC. This included 442 new and new consult head and neck oncology



UNC Multidisciplinary Head & Neck Oncology Team, left to right: Eric Halvorson, MD (Plastics); Marion Couch, MD, PhD (OHNS); Neil Hayes, MD (Medical Oncology); James McNab, MD (Radiation Oncology); Carol Shores, MD, PhD (OHNS); William Shockley, MD (OHNS); Jennifer Egan, MD (Pathology); Laura Patton, DDS (Dentistry); Laura Lyndon Miller (Program Assistant); Janet Southerland, DDS (Dentistry); Mark Weissler, MD (OHNS); Dale Flowers, RN (Clinical Trials); Sue Hayden, RN (Nurse Navigator); Aimee Shea, RD (Dietician); Sean Gallagher, RN (Nurse Navigator); Julian Rosenman, MD (Radiation Oncology); Ben Huang, MD (Radiology); Not pictured: Glenn Minsley (Prosthodontics), Valerie Jewells, DO (Neuroradiology); Stephen Bernard, MD (Medical Oncology); Joanne Sroczyński, MSW (Social Work).



Drs. Steve Lee and Carol Shores removing a cancerous thyroid lesion

patients. This was up 3.5% from 2007 and 5.4% from 2006. Our clinical practice continues to grow on a yearly basis.

The program now performs many ultrasound examinations in the ENT clinic for the evaluation and ultrasound guided needle biopsy of thyroid and other neck masses. Trans-nasal esophagoscopy and laryngeal video stroboscopy are also available for the evaluation of Head and Neck patients with special problems. Mr. Brian Kanapkey from speech pathology

works hand in hand with the surgeons in the management of post-treatment speech and swallowing dysfunction. Dr. Glen Minsley from dental prosthetics assists our patients with prosthetic management of head and neck defects. Dr. Bill Shockley has a special interest in the rehabilitation of facial palsy resulting from cancer therapy.

Sean Gallagher, RN, MS, and Susan Hayden, RN serve as our nurse coordinators for head and neck cancer patients. They assist patients as they navigate through their complex treatment protocols. They work closely with the patients and their families to insure that they are well informed about the multimodalities utilized in modern cancer treatment.

Ms. Laura Lyndon Miller is our intake coordinator. She arranges for initial consultations at UNC from referring physicians. She helps us gather all the outside medical information on these often complex patients.

Elizabeth Sherwood, RN, MS, ANP-C, assists with psychological support through the trying period of treatment and follow-up. She is the Coordinator of Survivorship Programs and helps our patients by providing support during and after treatment as they transition from active treatment to surveillance. Plans are underway to start a symptom management clinic in the fall, which will assist with follow-up of medications (i.e., anti-depressant, anti-anxiety) and emotional/mental health issues, as well as the whole range of side effects folks deal with related to surgery, chemotherapy, and radiation.



Nurse Navigator Sean Gallagher, RN

Dale Flowers, RN, works with Dr. Neil Hayes and others in medical oncology to assist patients to navigate through the complexities of treatment on the wide variety of experimental protocols available.

Xiaoying Yin, MD, MS who was hired last year as an assistant professor in the department, has had a fruitful year with several publications. Dr. Larry Marks has taken over the chairmanship of the Dept. of Radiation Oncology. He joins the University of North Carolina from Duke University and is actively recruiting new faculty.



Cynthia Nabut, RN, with Drs. Mark Weissler and Trinitia Cannon

Each year we run a very successful oral cancer screening day. Under the auspices of the Yul Brenner Foundation physicians spend an afternoon in the Oto-HNS clinic screening the public for oral cancer and other diseases of the head and neck. The nurse coordinators put on an exhibit and information center in the hospital lobby.

Dr. Adam Zanation, a former resident, will be completing his fellowship in skull base surgery at the University of Pittsburgh this summer and will then be joining our faculty. His training has concentrated on endoscopic trans-nasal resection of skull base lesions and will complement out already busy skull base program. We are also actively seeking another head and neck surgeon to assist with our ever growing clinical program in head and neck oncology.



Drs. Shockley, Ladner, Surowitz, and Cannon

Dr. Carol Shores will be moving her practice to our affiliated program at Wake Medical Center in Raleigh.

Clinical Trials

The Head and Neck Oncology Program continues to strive for a goal of having at least one clinical trial open for all of the clinical cancer scenarios seen frequently in our group. Since squamous cell carcinomas of the head and neck are

our most common tumor type, much of the effort has been focused here. We have three trials open to accrual currently, one for patients who present with locally advanced disease being treated in the curative setting and two for patients with recurrent setting. In initial therapy, UNC is one of the leading accruing institutions to OSI 3602, a trial which seeks to answer one of the key questions in combined modality chemoradiation currently on that table in head and neck cancer. This question is: does inhibition of the epidermal growth factor receptor add to standard chemotherapy in the setting of combined modality treatment of head and neck cancer. In addition to these trials, we are the lead institution for one of the only trials open in the United States for the treatment of iodine-refractory thyroid cancer with the MEK inhibitor AZD6244. Over the coming year we expect to open additional protocols, including those for the treatment of anaplastic thyroid carcinoma and salivary gland tumors.



Drs. Steve Lee and Marion Couch

Speech Pathology: The Head and Neck Cancer Voice Restoration and Swallowing Clinic

The Voice Restoration and Swallowing Clinic consist of a multidisciplinary team providing evaluations and therapy for a wide variety of head and neck cancer patients. Speech pathology services in the area of head and neck cancer voice restoration and swallowing are covered by speech pathologists Brian Kanapkey, Linda Hube, and Leslie Johnson.

Patients treated in the speech pathology clinic include but are not limited to those patients with partial and total laryngectomy with or without tracheoesophageal puncture (TEP), oral cavity cancers, neck cancers, skull base tumors, short and long term tracheostomy, and chemotherapy and radiation injury patients.

The ENT surgeons within the UNC ENT Clinic, along with oncology physicians evaluate cancers and provide proper surgical and /or chemotherapy and radiation treatment for these patients. The speech pathologist works on order from the ENT physician or oncologist and provides evaluation and treatment for the functional disorders that result from cancer treatment. Functional deficits affecting maintenance of proper

nutrition by mouth and aspiration risks are evaluated and treated by the speech pathologist.

The latest in technology for swallowing therapy, such as surface electromyography for biofeedback and VitalStim electrical stimulation is used here at UNC. The techniques allow for excellent data keeping for research analysis. In this way, the physicians and speech pathology team in the UNC ENT Clinic help to contribute new information in the area of swallowing rehabilitation after treatment for head and neck cancer.

Yet another role filled by the head and neck clinic speech pathologist is in the area of patient and family teaching before and following tracheostomy tube placement. Speech pathology is as part of the team seeing this population for the purpose of creating a much more comfortable patient facing surgical decisions.

The head and neck clinic speech pathologist also provides therapy to help restore optimal communication to the patient who has had laryngectomy and oral cavity resections and reconstruction. Additionally, Botox injection(s) evaluations are available to those who fail to develop TEP speech post-operation.

Finally, a program for remediation of oversized TEP and persistent granulating tracheoesophageal fistula is maintained by Brian Kanapkey using silicone for creation of extended tracheoesophageal flanges to stop around the prosthesis leakage. This process reduces pulmonary aspiration and risk of aspiration pneumonia from around the prosthesis leaks.

Brian Kanapkey also heads up the UNC ENT Swallowing Clinic in conjunction with Dr. Robert Buckmire. The clinic provides a multidisciplinary approach to swallowing disorders related to problems of the mouth, throat and upper esophagus. The clinic works closely with physicians in gastroenterology and radiology to provide identification and treatment for oral and pharyngeal disorders as well as swallowing problems related to gastrointestinal issues. Objective instrumentation is used to aid the physician and speech pathologist in correct identification of swallowing disorders and treatment is undertaken with the latest technology available. Currently, the clinic is held one day a week.



Drs. Carlos Ebert and Trinitia Cannon talk to Speech Pathologist Brian Kanapkey about a swallowing study



Dr. Robert Buchmire examines a patient's larynx via nasoendoscopy.

The UNC Voice Center

The UNC Voice Center is comprised of a multidisciplinary team providing specialized diagnostic and therapeutic services to dysphonic patients with all descriptions of voice disorders and laryngeal pathologies. The Clinic is staffed by members of the Department of Otolaryngology and Speech Pathology with a specialty in voice disorders, as well as a singing voice specialist. Beyond the treatment of voice disorders, the Voice Center also acts as an information resource to the referring medical community along with providing educational materials, seminars, and outreach programs on voice science, care of the voice, and state of the art diagnosis and treatment of voice disorders.

The Voice Center Director, Dr. Robert Buckmire joined the faculty in September of 2004 after completing a post-graduate fellowship in Laryngology and Care of the Professional Voice, and a subsequent faculty position at the University of Pittsburgh. His special clinical and research interests include care of the professional voice, diagnostic laryngeal electromyography, microlaryngeal surgery, laryngeal framework surgery and the diagnosis and treatment of swallowing disorders. Dr. Mark Weissler has maintained an

active practice in laryngology since 1986 with special emphasis on the treatment of laryngeal dystonias, benign and malignant laryngeal neoplasms, vocal fold paralysis, and laryngeal and tracheal stenosis.

Dr. Ellen Markus, who is the Coordinator of the UNC Voice Center, is a speech language pathologist and singing voice specialist. Dr. Markus has a Master's Degree in Speech Pathology and a Doctorate in Vocal Music Performance and specializes in the care of the professional singer. She has lectured regionally and nationally on the care and prevention of voice disorders. Linda Hube, who holds a Master's Degree in Speech Pathology, has a background in theatre and vocal music and special training in voice and swallowing disorders. Ms. Hube also has a special interest in the behavioral approach to the treatment of Spasmodic Dysphonia and has lectured on the topic at both regional and international symposia.

Drs. Buckmire and Weissler, Dr. Markus, and Ms. Hube continue an active practice in the treatment of a wide variety of laryngeal and voice problems, including laryngeal dystonia, vocal cord paralysis and paresis, cysts, polyps, nodules, and other pathologies of the larynx in both casual and professional voice users.



After the exam, Dr. Buckmire shows the pictures and discusses the findings with the patient.



Dr. Ellen Markus, Coordinator of the Voice Center, and Linda Hube, both speech pathologists.

The UNC Hospitals Hearing and Voice Center at Carolina Pointe

The UNC Hospitals Hearing and Voice Center at Carolina Pointe celebrated its second anniversary in April this year. This community-based Audiology and Speech Pathology clinic works in close collaboration with the UNC Ear, Nose and Throat physician group and is conveniently located at 5915 Farrington Road adjacent to the intersection of Highway 54 and Interstate 40.

Diagnostic voice evaluations are performed at Carolina Pointe and are provided by an interdisciplinary team of highly-experienced physicians and speech pathologists. Dr. Ellen Markus is the Voice Center Coordinator. She is a speech pathologist, singing voice specialist, and holds a doctorate in vocal music performance. She has taught singing for over 30 years and co-founded the UNC Voice Wellness Clinic in 1991 with Dr. Mark Weissler. She specializes in rehabilitating singers who have experienced vocal injury, as well as working with all other types of voice disorders. Dr. Markus shares clinic time at Carolina Pointe with Linda Hube who is also a speech pathologist and has a background in theater and singing. She works with patients with both voice and swallowing disorders and has a special interest in the Spasmodic Dysphonia population. Available voice and speech services include behavioral assessment, videolaryngostroboscopy, acoustic and aerodynamic measurements, assessment of vocal ergonomics, and spirometric evaluation.

In addition to the voice program, the audiology team at the UNC Hospitals Hearing and Voice Center provides a wide range of audiology services. They offer hearing evaluations for pediatric through adult patient populations as well as impedance testing including

tympanometry and acoustic reflexes. They are able to assess otoacoustic emissions in patients of all ages, which provides objective information about outer hair cell function in the inner ear.

The audiology program at the UNC Hospitals Hearing and Voice Center has experienced consistent growth over the past two years. Gregory Smith continues to oversee the delivery of audiology services at the UNC Hospitals Hearing and Voice Center. And recently, Drs. Jill Ritch and English King joined the audiology team at Carolina Pointe. Dr. Ritch is a pediatric audiologist with over 11 years of experience at UNC Hospitals and Dr. King completed her audiology externship at UNC Hospitals and is a 2007 graduate of the doctoral program in audiology at James Madison University. Dr. King is an adult cochlear implant specialist and has an interest in amplification for the adult patient population. “Over the past year, we have experienced a 30% increase in patient visits and a 20% increase in the number of audiology procedures performed at Carolina Pointe,” says Smith. “Certainly, the addition of Drs. Ritch and King to the audiology team at Carolina Pointe has been vital to our success and continued growth,” added Smith.

The addition of Drs. Ritch and King has allowed for further expansion of the audiology services available at Carolina Pointe. They now offer hearing aid selection, fitting and follow-up appointments for children of all ages, and cochlear implant services for adults including candidacy evaluations, device programming, and routine check-up appointments.

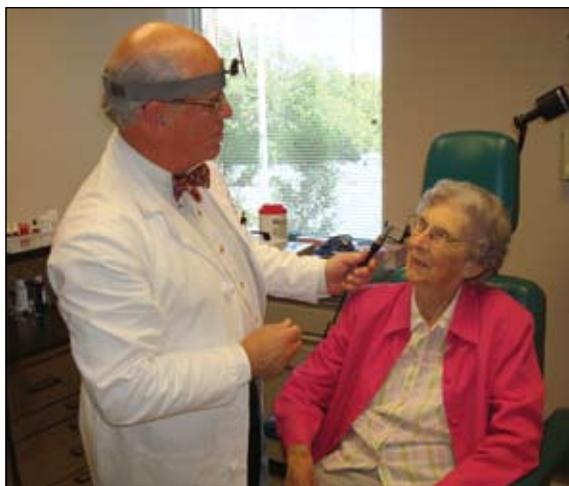


Dr. English King and Gregory Smith, both audiologists

The adult hearing aid dispensing program has also experienced steady growth over the past year. “Our goal is to provide every patient with the education they need when deciding to purchase new hearing instruments,” says Smith. Focusing on patient education and the latest digital technology has contributed to the growing number of satisfied and successful hearing aid users. “Our hearing aid return rate continues to remain extremely low at around 1%,” says Smith. “The bottom line is that we want our patients to be satisfied with the product they choose,” adds Smith. Patients are allowed 30 days to evaluate their hearing aids and they may return their hearing aids for any reason during the evaluation. All hearing aids purchased at the Hearing and Voice Center come with a minimum one-year warranty, which also includes loss and damage coverage. Recognizing that cost may be a concern for some patients, UNC Hospitals offers payment plans that can be arranged prior to the hearing aid purchase. Additionally, patients are encouraged to bring in hearing aids that are either broken or not functioning properly for repair or adjustment, regardless of where they were originally purchased.

To further improve patient access to the audiology and speech pathology programs offered at UNC Hospitals, the Hearing and Voice Center has plans to expand into available clinic space at Carolina Pointe adjacent to the clinic’s current location. “The expansion is still in the planning stage, however, we are anticipating the addition of two sound booths for audiometric testing, and two voice therapy suites.” says Smith. This expansion will provide a much needed opportunity for the adult and pediatric hearing aid programs to grow and will allow the UNC Voice Center to shift their clinic operations to a convenient and accessible location. The time frame for this expansion is not certain, however, construction is expected to commence within the next year.

The UNC Hospitals Hearing and Voice Center is open Monday through Friday, from 8:00 AM to 5:00 PM. For more information regarding available services, appointments or referrals, please call (919) 490-3716.



Dr. Pillsbury checks a patient's ears



Dr. Oliver Adunka with a cochlear implant patient and her mother, in the clinic for her first post-op visit.

The UNC Ear and Hearing Center

The UNC Ear and Hearing Center, directed by Dr. Craig Buchman, is a regional center that provides specialized diagnostic and surgical care to adult and pediatric patients with diseases of the ear, skull base, head, and neck. The Center represents a comprehensive multidisciplinary approach to service delivery and patient care. Multiple professionals trained in varying aspects of hearing disorders staff the Center. Specialists of the Center are from the Division of Neurotology & Skull Base Surgery, the Division of Pediatric Otolaryngology, and the Carolina Children's Communication Disorders Program (CCCDP)/CASTLE, and the UNC Hospitals Division of Audiology & Speech Pathology. These specialists include pediatric and adult audiologists and otolaryngologists, auditory/verbal therapists, speech pathologists, and a designated Ear & Hearing Center nurse.



Ear and Hearing Center nurse, B.J. Squires, RN, with Director of the Center, Dr. Craig Buchman

The Ear and Hearing Center serves as a resource, not only for UNC Hospitals, but also for patients, physicians, nurses, audiologists, and other healthcare professionals throughout the State of North Carolina. Staff services range from consultation, diagnosis, disease treatment, and medical/surgical interventions, to rehabilitation and follow-up.

Extensive audiology services, in conjunction with Otolaryngology/Head & Neck physicians, are an integral part of the Ear & Hearing Center. Newborn

to geriatric hearing screening; hearing aid assessment, fitting, and dispensing; and cochlear implantation evaluation are offered. American Sign Language interpreter service is also readily available through “Deaf Talk”, a video interpreting system. Diagnostic exams available include behavioral, evoked response, and vestibular testing. Patient education, on a wide variety of hearing related conditions, has been developed for patients and families. Center staff also participate in 1) community-based efforts in the promotion of hearing wellness for schools and other groups, 2) professional organizations focused on the hearing impaired and related disorders, 3) development and involvement in local and national conferences promoting the goals of the Center and academic interests of the University, and, 4) ongoing hearing-related research. Otolaryngology physicians, Ear and Hearing Center nurses, audiologists, speech pathologists and other staff are also committed to student teaching, and the development and provision of continuing professional education, both on the UNC Hospital campus and the state.

In the last year, the Ear and Hearing Center at UNC has been very busy locally, nationally, and internationally. Clinically, our team of professionals evaluated more than 400 children with newly identified hearing losses from around the Southeastern United States and abroad. Given our extensive experience and unique multidisciplinary approach, we continue to see a number of tertiary referrals for the diagnosis and management of challenging pediatric hearing loss cases. Last year alone, over 100 new hearing aid fittings and nearly 100 cochlear implants were performed in the pediatric population. It has not been unusual for amplification to be undertaken before 3 months of age at UNC and cochlear implantation to occur before 12 months. Professionals from the Ear and Hearing Center continue to collaborate closely with professionals from around the state to provide additional services for these children.

The Ear and Hearing Center also evaluated more than 100 new adult patients with hearing loss for possible cochlear implantation last year, implanting nearly 100 new

patients. Recent advances in surgical techniques and device technology has allowed surgeons at UNC to implant patients with more residual hearing than ever before. Patients with hearing loss no longer need to be deaf before considering cochlear implantation. Drs. Adunka, Buchman, Clark, and Pillsbury have begun to test the effects of combining hearing-preserving cochlear implantation with amplification (also called Electro-acoustic stimulation or EAS) in an effort to serve a greater number of patients with sensorineural hearing loss. Preliminary results from these studies are very encouraging. Many of these patients have significant improvements for hearing in noise when compared to their performance with their hearing aid alone.

Another area of interest is bilateral cochlear implantation. Drs. Buchman and Pillsbury have been actively involved in bilateral implantation in selected patients more than 6 years. In their early studies, bilateral implants showed a distinct advantage for both hearing in noise and sound localization abilities. While not for all patients, bilateral implantation is more common than ever, now being extended to the pediatric population as well. Today, more than 80 patients have received bilateral implants at UNC. Many of our previously implanted recipients are requesting second side implantation with the hope of improvements in sound localization and hearing in noise.

While cochlear implants are useful for most patients with severe to profound sensorineural hearing loss, occasionally patients may not benefit from implantation because of disorders related to the cochlear nerve or cochlea. In such cases, direct brainstem stimulation may provide improvements in communication abilities. Such brainstem stimulation has been used for patients with tumors of the brainstem in the past but has never been applied to non-tumor patients in the United States. In an effort to provide this specialized technology to patients in need, Dr. Buchman and Dr. Matthew Ewend from the UNC Division of Neurosurgery recently performed a brainstem implant in a patient that suffered from cochlear ossification following meningitis. This patient has now been using his device for more than 9 months with significant demonstrated benefits. For this patient, the brainstem implant has provided dramatic improvements in sound awareness and enhanced lipreading abilities thus far.



Dr. Pillsbury with his nurse, Lynda Lucas, RN

The UNC Adult Cochlear Implant Program

The Adult Cochlear Implant Program at the University of North Carolina at Chapel Hill in collaboration with UNC Healthcare represents the largest and most prestigious cochlear implant center in North Carolina and is well recognized across the country. The program has been in existence since the late 1970s and has managed to grow and thrive throughout the years, providing quality medical care and device support to over 500 adult cochlear implant recipients. The number of patients able to benefit from cochlear implants increases annually as a result of expanding candidacy criteria, new developments in cutting-edge cochlear implant technology, and increased referrals from knowledgeable practitioners in the fields of otolaryngology and audiology who strive to provide their patients with access to the most advanced otological care for their hearing. The UNC Adult Cochlear Implant Program remains unique in its incorporation of a sophisticated team of scientists and healthcare professionals, including, Harold C. Pillsbury, MD; Craig A. Buchman, MD; Oliver F. Adunka, MD; Marcia Clark Adunka, Au.D; English King, Au.D; and a valuable team of researchers, including Joseph Hall, PhD; John Grose, PhD; Emily Buss, PhD; Charles Finley, PhD.



Director of the Adult Cochlear Implant Program, Dr. Marcia Clark Adunka

A cochlear implant is an electronic device which bypasses the outer and middle ear, providing direct stimulation to the surviving auditory nerve fibers within the cochlea. The procedure involves the surgical implantation of a receiver stimulator behind the ear in combination with an external speech processor to communicate with the internal component. Historically, cochlear implants have only applied to patients who suffered from bilateral severe to profound sensorineural hearing loss and who no longer received measurable benefit from acoustic hearing aids. This criterion for candidacy has changed dramatically in the past few years, and we are now able to offer this remarkable technology to patients with more residual hearing as evidenced by audiometric threshold testing.

The basic principles of cochlear implant technology have remained the same over the years; however its clinical application has been manipulated with newer cochlear implant approaches and concentration on hearing preservation. In January 2007, we embarked on a new clinical trial sponsored by MED-EL Corporation and entitled Electroacoustic Stimulation. This study incorporates hybrid device technology; a partially inserted cochlear implant array to stimulate the high frequency region of hearing within the cochlea and an acoustic hearing aid to maximize hearing in the low frequencies. The combination of acoustic amplification via a hearing aid for the low frequency hearing of a patient in combination with high frequency stimulation via a cochlear implant has proven to be a promising method of treatment for patients with varied degrees of hearing loss, most notably those with ski-sloped configurations.

At present, we have implanted 10 patients using the EAS approach and the recorded outcomes have been robust for all study patients. In April of this year, we had the opportunity to share our EAS results with other colleagues and medical professionals at the 10th International Conference on Cochlear Implants in San Diego, California. Our findings served to reinforce previous European data demonstrating improved hearing in noise performance as well as improved music appreciation among these hybrid cochlear implant recipients. Our commitment to this trial will be ongoing as we continue to seek and enroll more qualified participants and to monitor the progress of our current recipients. By pursuing these research avenues and being dedicated to new advances in science, we are better able to serve our patients and their families. As the hearing care professionals of UNC, this remains our primary mission. If you would like to receive information regarding our EAS investigational trial or other clinical trials associated with hearing, please contact the clinic at 919-843-1692.

Bilateral cochlear implantation is another avenue of growth at UNC Healthcare as well as other cochlear implant centers nationwide. The trend toward dual implantation, whether in a simultaneous approach or via sequential procedures, is the result of published data, outlying the benefits of bilateral hearing. These well-documented benefits, include localization of a sound stimulus (important for safety in one's surroundings) and improved hearing in background noise as well as quiet environments. As of January of 2006, most private insurance companies are demonstrating support to insured patients who are in need of bilateral cochlear implants to improve their hearing abilities. More and more patients are taking this approach to their hearing. It appears the trend is here to stay!

The UNC Adult Cochlear Implant Team continues to grow through its employment of new personnel, dedicated to the treatment and care of its ever-expanding cochlear implant population. In November of 2007, English King, Au.D permanently joined the clinical staff of audiologists at UNC Healthcare. In a joint effort with Marcia Clark Adunka, Au.D, they represent the team of adult cochlear implant audiologists.

Pediatric Audiology

The UNC Pediatric Audiology Team, under the Direction of Patricia A. Roush, AuD, continues to see an expanding caseload of infants and young children with hearing loss. Since the North Carolina legislature mandated newborn hearing screening in 1999, the UNC program has seen an ever-increasing number of babies referred from newborn hearing screening programs throughout the state. As in other hospitals throughout the state, babies born at UNC receive a hearing screening prior to hospital discharge. At UNC, nurse coordinator Chris Stancil ensures that all infants in the well baby nursery receive a hearing screening prior to hospital discharge. Audiologist Patti Reitz screens infants admitted to the Newborn Intensive Care Unit (NICU).

Many of the children who were identified with hearing loss as infants during the early years of the statewide screening program are now entering kindergarten with speech and language skills on par with their hearing peers, due to the benefits of early identification and intervention. It is now common for many infants to be fitted with hearing aids at less than four months of age as compared to past years when children



Dr. Patricia Roush with a very special patient

were often two to three years of age before their hearing loss was identified. One of the challenges we are facing is in providing access to pediatric audiology services for children throughout the state. In an effort to provide greater access to our services, the Department of Otolaryngology's Carolina Children's Communicative Disorders program opened a satellite CASTLE pre-school in Wilmington in the past year. The UNC pediatric program was pleased that a grant proposal submitted by Dr. Roush to the Michael and Laura Brader-Araje Foundation was funded in January 2008. The funds received allowed us to purchase a tympanometer, otoacoustic emissions equipment and a hearing aid verification system for the Wilmington site.



Future audiologist or otologist?

In addition to following several hundred children with typical “sensory” hearing loss, the pediatric audiology team in conjunction with the UNC pediatric cochlear implant team is also following over 135 children who have been diagnosed with auditory neuropathy/auditory dyssynchrony (AN/AD). While AN/AD is not a new disorder, newer test techniques in recent years have allowed us to more accurately diagnose it. AN/AD presents new challenges in management for pediatric audiologists, and the UNC pediatric team in conjunction with UNC otolaryngologists have developed an evidence based protocol for evaluation and management so that all infants diagnosed with this disorder will have the most effective treatment possible.

The UNC pediatric program was highlighted at several state, national and international meetings this past year. In August, Dr. Roush was an invited speaker at the First Latin American Pediatric Audiology Conference in Sao Paulo, Brazil where she gave two presentations: one on hearing aid fitting in infants and a second on audiological management of auditory neuropathy/dys-synchrony. While in Brazil, Dr. Roush traveled with colleagues Drs. Richard Seewald and Judith Gravel to an audiology clinic located in the nearby city of Sorocaba where they met with and answered questions from staff who were developing protocols for the evaluation and management of infants and children with hearing loss. In October, Drs. Roush and Buchman

gave a presentation entitled “*Auditory Neuropathy/Dys-synchrony: Diagnosis and Clinical Management*” at a statewide conference for parents and professionals held in Greensboro. The pediatric audiology staff traveled to Chicago in December to attend the Sound Foundation through Early Amplification 4th International Conference where Drs. Roush and Buchman gave invited presentations on the topic of management of hearing loss in infancy. Dr. Roush traveled to Spain in February to give an invited presentation entitled “*Behavioral Audiometry in Infants and Children*” at the Early Identification, Diagnosis and Treatment of Deafness in Infants Conference held in Madrid.

North Carolina was fortunate to host the annual convention of the American Academy of Audiology in Charlotte in April of 2008. Prior to the convention, UNC faculty and staff gave a half day workshop highlighting our team approach to the evaluation and management of infants with hearing loss. Dr. Roush was joined by Drs. Buchman, Grose and Teagle. Thomas Page, a speech and language pathologist on the UNC pediatric cochlear implant team and Dr. Jackson Roush, Director of the Division of Speech and Hearing Sciences also participated. In addition to the workshop, Drs. Roush and Buchman gave a featured session entitled; “*Auditory Neuropathy/Dys-synchrony: No Simple Solutions*” and Dr. Roush gave a pediatric grand rounds presentation at the same conference. Dr. Roush gave two invited presentations in Munich, Germany on April 18th and 19th entitled: *Hearing Instrument Fitting in Infants: Practical Considerations and Challenges* and *Audiological Management of Infants and Children with Auditory Neuropathy/Dys-synchrony*. The 4th Annual Cochlear Implant Symposia on Auditory Neuropathy/Dys-synchrony and Cochlear Implantation was held at the Nemours Children’s Hospital in Delaware on April 29th. Dr. Roush gave an invited presentation entitled: *Auditory Neuropathy: A Clinician’s Perspective* while Dr. Buchman gave an invited presentation at the same meeting on medical considerations in auditory neuropathy. Finally, in June, Dr. Roush was invited to give a presentation on the use of hearing aids in children with auditory neuropathy and participate in a

2 ½ day Guidelines Development Conference on Auditory Neuropathy held in conjunction with the international Newborn Hearing Screening Conference in Cernobbio, Italy, June 19-21. Guidelines developed at the conference will be published later this year.



At the Fourth International Pediatric Audiology Conference in Chicago. Drs. Craig Buchman, Patricia Roush, Sarah Martinho, Paula Johnson, and Corrine Macpherson.



Pediatric implant audiologists Holly Teagle (left) and Lisa di Maria engage with the personality of the hour, Ivan Jiminez, in a mapping session. Ivan is 6 years old and was implanted in April.

**The W. Paul Biggers, MD
Carolina Children’s Communicative Disorders Program
and the UNC Pediatric Cochlear Implant Team**

Increasing numbers of children are coming to UNC Pediatric Cochlear Implant Team each year. They include both new patients and children who have been implanted by other programs. The team has now managed close to 600 children with cochlear implants, past and present, from 77 North Carolina counties and two neighboring states.

The success of cochlear implants is presenting challenges to clinicians, educators, and policy makers. Children with cochlear implants who were born without hearing cannot make significantly effective progress beyond surgery without four or more years of intensive therapy and specialized educational services. This process requires a team approach and must fully engage the child’s family. Each team member, including school professionals and the child’s parents, must participate effectively in a coordinated “auditory-based approach” to the development of spoken language. This is complicated

by the fact that most teachers of the deaf and other professionals in the field have been trained to work with sign language and have found themselves unprepared to develop auditory skills and spoken language in these children.

The commitment to follow implant patients as they develop, to support a team approach, and to assure that the technology is doing its job are all critical aspects of The W. Paul Biggers, MD Carolina Children's Communicative Disorders Program (CCCDP) mandate. Program Director Carolyn J. Brown joined ENT to develop the CCCDP shortly after it was funded. She came to UNC from California, where she had served with Dr. William House on the world's first pediatric cochlear implant team. Carolyn has also responded to the challenges posed by the needs of pediatric implant patients by creating the Center for Acquisition of Spoken language Through Listening Enrichment (CASTLE) to provide both direct services to families and the training and mentoring required by professionals. CASTLE was founded six years ago to develop a prototype program providing auditory-based professional training and mentoring, family training and support, speech therapy, and a model preschool program for children with severe to profound hearing loss.

CASTLE is teaching children who are deaf to listen and to talk. Through advanced technologies and cutting edge school and family-based interventions, these children are gaining direct access to mainstreamed education and the potential to become fully productive and enfranchised citizens. Rapidly growing public acceptance of cochlear implants has posed a significant challenge, especially to school professionals and policymakers. An essential part of the mission of CASTLE is to provide a practical model to clinicians and policy-makers for giving access to audition and the potential for spoken language to children who are born deaf. It also presents an extraordinary opportunity to reduce costs, both the immediate costs of deaf education and the long-term costs of supporting people who are deaf or hard of hearing with public resources.



At her retirement party, Carolyn Brown joins Dean and Rene Griffin of Swannanoa, NC, with their daughters Jessica (left) and Kristen, who both have cochlear implants.

Having demonstrated its ability to deliver effective services to both families and professionals, the program has been expanded to include a center in Wilmington. An additional site is planned for the western part of the State as funding becomes available. This will facilitate access to training and services in every North Carolina county and school system, and will make CASTLE a unique regional model that will be more effective than a centralized program, and that can be replicated elsewhere.

The expansion project has been initiated by Carolyn Brown with grants from The Duke Endowment, The Cape Fear Memorial Foundation, and The Cannon Foundation. Additional funding is being sought to continue the expansion of CASTLE to enhance program components for families, school professionals, and early intervention educators across the North Carolina.

The North Carolina General Assembly has provided for the core budget of the CCCDP with a recurring grant now totaling \$503,000/year. The main CASTLE, located in Durham, is currently funded by the Oberkotter Foundation and the State of North Carolina. State funding for CASTLE, beyond the core budget for the CCCDP, has been provided since 2004, increasing to \$575,000 in the State budget recently approved for 2008-09. This brings the total investment by the State in CASTLE to nearly \$2 million.

Responding to the Challenge

Dr. Harold Pillsbury serves as Executive Director to the CCCDP. Dr. Craig Buchman is Medical Administrative Director, and, along with Dr. Carlton Zdanski, performs most implant surgeries for the pediatric program. Dr. Buchman is also director of the Ear & Hearing Center. The surgeons are involved with all aspects of the CCCDP, participating in clinical staff meetings, supporting the audiologists and speech-language pathologists who follow the children as they develop, and attending professional meetings in the United States and Europe.

Holly F. B. Teagle, AuD, is Clinical Director of the Pediatric Cochlear Implant Program at the CCCDP, having taken responsibility for this aspect of the program after Program Director Carolyn J. Brown turned much of her attention to the expansion of CASTLE. Holly has also served, among other roles, as the UNC Site Coordinator and Principal Investigator for an NIH (NIDCD)-funded study entitled Childhood Development after Cochlear Implantation (CDaCI).

The Pediatric Cochlear Implant Team performed more implant surgeries than ever before this year. Of the 99 surgeries performed between July 1, 2007 and June 30, 2008, 18 were revision surgeries, replacing devices that had malfunctioned, and 29 were bilateral surgeries in which the children received a second implant. The team includes three surgeons, five audiologists, two speech-language pathologists, and two social research assistants. At the time the program was founded by Dr. Biggers fifteen



Sammy



Micah and Brianna



Mylah



Anna

years ago, there were just 14 children to follow. With the addition of CASTLE the staff has been expanded to include three additional speech-language pathologists, one full-time and one part-time certified auditory-verbal therapist, and four teachers of the deaf.

Today the CCCDP continues to tackle the range of challenges confronting the families of children with cochlear implants. With children committed to an auditory-based track throughout North Carolina, families are confronted with schools and other institutions that are unable to respond effectively. The CCCDP and the North Carolina Department of Public Instruction (DPI) have been racing to catch up. Many teachers of the deaf have now been introduced to the auditory-based approach through CASTLE. The effort has come a long way, but a great deal more remains to be accomplished. The expansion of CASTLE to additional locations in the east and west is greatly needed. And, the CCCDP is continuing to develop training standards for professionals involved in the state’s early intervention program and those working with preschool and grade school children.

The programs at CASTLE are thought to be among very few in the United States designed to respond to the broad requirements of a successful pediatric cochlear implant program. Utilizing its own preschool classrooms, CASTLE provides hands-on training in auditory-based therapy and teaching techniques for speech pathologists and teachers of the deaf, a practicum site for graduate students in the UNC system, a Family Learning Center, and a therapy program for children with hearing loss. An intensive training program for school professionals and early interventionists in Wake County was funded by the John Rex Endowment 4 years ago as a prototype for what is expected to follow across North Carolina.

Another Landmark Year for CASTLE

The CASTLE site in New Hanover County, opened in January 2007, has made speech therapy, speech evaluations, and a preschool classroom available to area families from the very beginning. The facility includes two

classrooms, two therapy rooms, a family learning center, and, recently, an audiological sound booth. Speech/language Pathologist Meagan Evans, PhD, CCC-SLP, is providing speech/language evaluations, auditory-based speech therapy, and Parent Participation Sessions, all designed to develop listening and language skills in children who are deaf or hard of hearing. In addition, Dr. Evans has gradually extended training and mentoring support to meet the needs of school professionals in surrounding counties.

The training and mentoring of school professionals is central to the mission at CASTLE. The New Hanover site is in direct contact with schools in a half dozen surrounding counties. Additional funding is sought for the purpose of making the Professional Training and Mentoring Program easily accessible to school systems throughout eastern North Carolina.

CASTLE's New Hanover Preschool Program is currently serving children from three counties. The lead teacher is Francisca Hernandez-Casillas, MS, a teacher of the deaf with auditory-based training received in California and North Carolina. The classroom population is growing as schools and families learn of the program. The "Mommy and Me Toddler Language Group" continues to be made available as needed.

In total, the New Hanover facility has served twenty children from six counties during the year ending on June 30. These counties are Brunswick, Columbus, Cumberland, Duplin, New Hanover, and Sampson. The New Hanover School System has been very supportive and has contracted with us for preschool services, auditory-verbal therapy, and extended school year services for school age children. We have participated in local events such as an annual "Coming Together Conference" and an "Appreciation Tea" for staff in the county.

There have been a number of exciting developments for CASTLE in the past year that strengthen the support system offered to North Carolina families. Funding has been received to install a sound booth in the New Hanover facility and funding is currently sought for an audiologist. In making audiological services available, the program is



Teacher Sherri Vernelson and kids in a classroom at CASTLE

growing toward an effective extension of the prototype center in Durham.

"Insight," a parent education group, now meets at the Durham facility on a monthly basis. This addition to the program has been a response to the growing perception that more information was needed than time allowed during the weekly



Teacher Sindy Poole encourages kids to guess what's in the red bag.

parent participation sessions already provided. It was felt that parents could be educated about many issues and necessary skills in a more comprehensive manner. The monthly Insight group sessions have covered skills such as singing with your child, troubleshooting your child's cochlear implant, and language stimulation techniques. Attendance is expected for parents of children in the Preschool

Program and is also open to all

other CCCDP / CASTLE families. Every effort is made to support the ability of parents to attend, with flexible scheduling and the availability of childcare.

“Parents Educating Parents” is another new offering for families who are starting the preschool or therapy process for the first time. The program involves two meetings with a “Parent Educator” assigned by CASTLE staff. The first meeting takes place on site at CASTLE and a second is in the home. Following these meetings, the parent can choose whether to continue a relationship with the parent educator. This is designed to give parents access to someone who has “already been there” and can provide a level of support that professionals are often unable to provide.

For the first time this year, CASTLE hosted 8 auditory-verbal modules in collaboration with the North Carolina Office of Education Services. These workshops were provided free of charge for North Carolina professionals.

Early Intervention as Critical Priority

Early identification and intervention are key factors in making the most of auditory and speech potential for children who are deaf or hard of hearing. Early childhood is the critical period for language development. The first six months of life may be the most significant. Research confirms that the language skills of children are ultimately enhanced when intervention is initiated prior to six months of age. At CASTLE, parents receive counseling, education, and guidance in one-on-one sessions emphasizing the acquisition of spoken language skills through structured listening. Parents and children meet regularly with therapists to learn strategies and techniques that promote listening and speaking. With the help of the Family Learning Center and a resource library, parents and caregivers learn to integrate language development into play and other daily activities.

Training internships are available at CASTLE for professionals in North Carolina working with children who are deaf or hard of hearing and their families. Professionals receive intensive, hands-on training in the use of an auditory-based approach. Additionally, professionals are provided opportunities to learn about the medical, surgical, and audiological management of hearing loss, including new technologies. Numerous school districts across the state have begun to take advantage of this resource, sending staff for one-week internships.

The CCCDP has also facilitated the professional development by providing periodic seminars and two-day conferences. An Institute for Auditory-Verbal Therapy offered for graduate credit, known affectionately as “The Summer Institute,” is being repeated annually. The Summer Institute provides instruction with hands-on clinical experience. Although North Carolina professionals are our priority, this program has received national recognition and has been attended by professionals from a number of states, as well as Canada and Mexico. In this way, a growing number of professionals across North Carolina have been exposed to the basic principles of an auditory-based approach.

The annual CCCDP Fall Conference, co-sponsored by the North Carolina A.G. Bell Association, featured Judith Simser this past year, an internationally acclaimed authority on the education of children with hearing loss. Parents and professionals attended from across North Carolina, including representatives from about 30 public school districts. Proceeds from the Conference are donated to help pay for an annual weekend camp for deaf children and their families each year.

Foundations for Research

The UNC Pediatric Cochlear Implant Team has monitored audiometric and speech-language measures for each patient in the program since 1993. Testing begins prior to surgery and continues every six months to a year. Some of these children are now entering college. Managed by David Perry, the assembled data is growing rapidly and is currently in the process of expansion to accommodate bilateral implantation.

The CCCDP is one of six implant centers in the United States participating in a NIH (NIDCD)-funded longitudinal study entitled Childhood Development after Cochlear Implantation (CDaCI). The purpose of this multi-center study is to evaluate the impact of cochlear implantation on the “whole child,” with particular emphasis on longitudinal measures of cognitive, social, and behavioral development. Specific measures of language development, speech perception ability, and speech production are also being tracked. It is anticipated that data from this study will contribute to our understanding of the factors predicting implant-associated language use, communication competence, and perceived value of early implantation in light of associated costs.

Thirty children and their parents were enrolled as participants at the beginning of the study at UNC. Several families have moved away and had to drop out, but 27 remain. A total of 188 children with cochlear implants and 97 control subjects were enrolled for the entire project. The other participating centers include Johns Hopkins University (the Coordinating Center), House Ear Institute in California, the University of Miami, the University of Michigan, and the University of Texas Callier Hearing Research Center. This study has now been underway for six years and has recently been extended for another five years. Carolyn Brown served initially as the UNC Principal Investigator with Holly Teagle, AuD, as the UNC site coordinator. However, Dr. Teagle assumed the role of UNC Principal Investigator when the study was extended. Hannah Eskridge remains the primary speech-language pathologist on the project.

The Financial Assistance Program

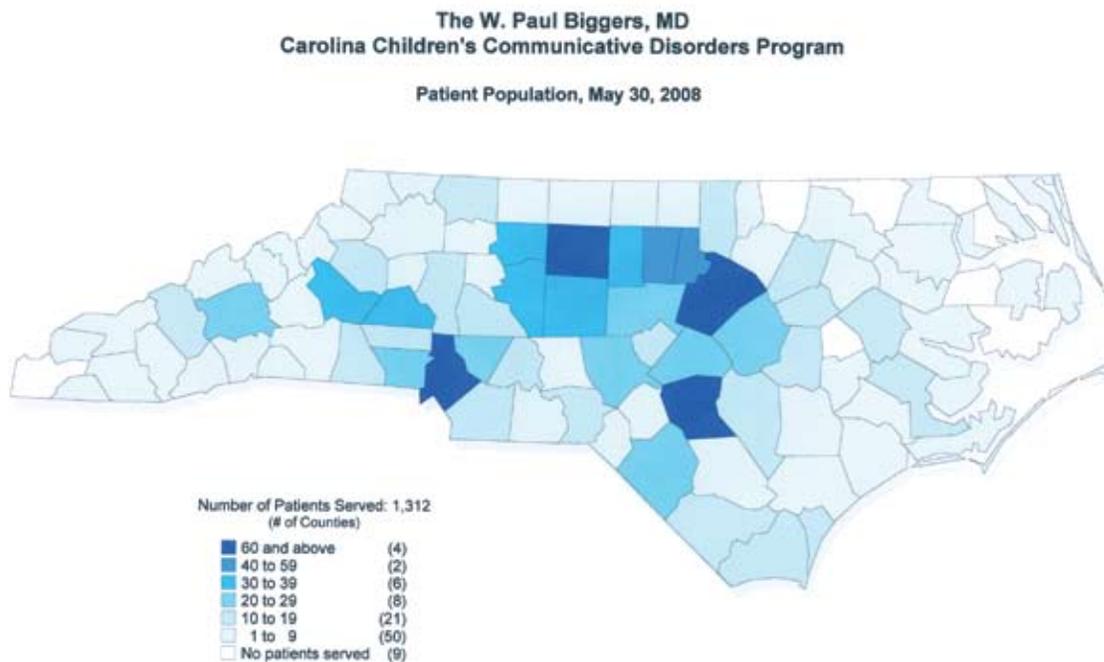
The CCCDP was first proposed to the North Carolina legislature by W. Paul Biggers, MD, in the spring of 1992, to include a financial assistance program. It was funded later that year and continues to respond to rapidly growing demands from across North Carolina. The grant serves children from birth to age 21, funding such technologies as frequency transposition hearing aids, digital programmable hearing aids, cochlear implants, assistive listening devices, and UNC-provided diagnostic services for children whose families cannot afford to pay. Medicaid currently funds most expenses related to cochlear implants, so the CCCDP grant only provides funding for certain implant accessories such as batteries, cords, and external equipment. There are children enrolled in the grant who had their cochlear implant surgeries before being accepted. The CCCDP accepts these children in order to help the families with the substantial costs of accessories, loss and damage coverage on external equipment, as well as UNC-provided cochlear implant programming and speech therapy.

Qualifying children are accepted into the CCCDP financial assistance program based on such criteria as family size, income, other medical expenses, and the limitations of insurance and other resources such as Medicaid. Since its inception, the program has enrolled 1312 children from 91 North Carolina counties. From June 1, 2007 to May 31, 2008, 76 new children were enrolled. A total of 438 children were enrolled at some point during this period. Of 368 currently enrolled children, 205 have cochlear implants.

Primary elements in supporting a hearing-impaired child's educational success are school visits and IEP (individual educational planning) sessions. CCCDP staff travel thousands of miles each year for school visits in support of children enrolled in the grant. School visits include observation of the child in the classroom, followed by a meeting at the end of the school day during which the CCCDP professional meets with parents and professionals, often including the child's regular teacher, teacher of the hearing-impaired, speech therapist, and advocacy representative, to discuss the child's needs and offer recommendations. CCCDP staff participate in IEP sessions with a

variety of school professionals to review progress and discuss new goals for the child's education.

A strong focus on building the capacity of school professionals has helped to make the University of North Carolina at Chapel Hill one of the leading centers for the development of spoken language in children with hearing loss. The program has created a comprehensive approach to the developmental challenges faced by children who gain access to sound much later than normal. CASTLE is making it possible for communities to support children with implants and, in particular, for public school systems to bring them up to grade level as quickly and effectively as possible. After receiving access to advanced technologies, many North Carolina children who are profoundly and pre-lingually deaf are now entering kindergarten with self-confidence and age-appropriate language.



Source: CCCDP, 2008.
Produced by: North Carolina Rural Health Research Program, Cecil G. Sheps
Center for Health Services Research, University of North Carolina at Chapel Hill.

RESEARCH



The Psychoacoustics Research Team. Seated: Madhu Dev (Social Research Specialist II); Sara Mamo, AuD (Audiologist); Tara Steplowski (Research Assistant); John Grose, PhD. Standing: Lisa Whittle (Social Research Specialist I); Emily Buss, PhD; Rose Eapen, MD; Mary Wolfe (Student Research Assistant); Joseph Hall, PhD

Joseph W. Hall, PhD, is presently the principal investigator on two R01 NIH research grants, both funded by the National Institute of Deafness and other Communication Disorders. One of these projects is Development and Plasticity in Normal and Impaired Hearing. A main initiative in this project is exploring the effect of sensorineural hearing loss on the development of hearing in children. The current focus is to examine the ability of children with sensorineural hearing loss to obtain benefit for speech perception in noise for noise that has spectral dips, temporal dips, or both spectral and temporal dips. The ability to benefit from such spectro-temporal dips probably accounts for the relatively good ability of listeners with normal hearing to understand speech in noisy environments. It is important to assess the effect of hearing loss on these abilities, particularly in children where experience with speech/language cues is relatively limited.

Dr. Hall's second NIH-funded grant is Spectro-temporal processing in normal and impaired ears. One series of studies in this project is investigating the ability of patients with sensorineural hearing loss to integrate information in one spectral region at a

given time with information in other spectral regions at a later time. This ability is probably quite useful in understanding speech when listening conditions are very poor, and a limitation in this capacity could account for part of the difficulty experienced by hearing-impaired patients in background noise. This project is also initiating new studies of auditory abilities that are important for normal hearing of complex sounds. One of the studies is investigating the auditory processes that underlie the ability to hear the pitch of a complex sound. The results of this study may help identify the particular kinds of sensorineural processes that underlie the perception of pitch. A second study is investigating central auditory processes that enable the perception of signals in fluctuating background noises. Many natural background sounds possess such fluctuations, and it appears as though auditory processes have developed that take advantage of the favorable listening intervals that occur in the fluctuation minima. These studies should lead to a better understanding of the factors that enable us to hear in background noise.

Dr. Hall is also a co-investigator on a new NIH grant that is investigating changes in brain anatomy and function that may accompany sensori-neural hearing loss in humans. This project uses both standard psychoacoustical methods and functional magnetic resonance imaging (fMRI) techniques. The approach is currently focusing on patients who have very steeply sloping hearing losses in one ear. Preliminary data suggest that it is possible the central auditory system reorganizes in such a way that greater weight is placed on the output of the better ear in such patients, even for frequencies at which hearing is normal in both ears. The results of this study will have implications for the ways in which brain function and structure change in response to peripheral hearing loss.

John H. Grose, PhD, is the Principal Investigator on an NIH-funded project that examines complex sound processing in normal and impaired ears. Most everyday listening environments consist of a multitude of sounds, many of which are fluctuating in level over time. The way in which the brain sifts apart this acoustic complex into its constituent sound sources is referred to as auditory perceptual organization. The root interest of Dr. Grose's project is to understand the role that temporal processing plays in perceptual organization and how impaired auditory systems compromise this ability. The current focus of this project is on



Dr. Grose measures a class of auditory-evoked potentials called "auditory steady state responses" (ASSR). This test requires that the listener be still but not asleep. A good way of ensuring this is to have the test subject watch a silent movie while Dr. Grose plays sounds into the subject's ears and records the ASSR through scalp electrodes. The particular purpose of this study is to assess temporal processing as a function of age.

delineating the specific types of temporal processing deficits that emerge early in the aging process, and on differentiating these from deficits associated with advanced age and cochlear hearing loss. Three areas of temporal processing are being investigated: (1) stimulus onsets and temporal fine structure; (2) temporal envelope coding; and (3) the relationship between temporal envelope processing and spectral integration in modulated maskers. The project utilizes both psychophysical and electrophysiological methodologies, and incorporates both speech and non-speech measures.

In addition to his major research emphasis, Dr. Grose is active clinically in the evoked potential testing of infants and toddlers, as well as patients with cochlear implants.

Emily Buss, PhD, is an auditory science researcher involved in a range of projects investigating the perception of sound in human listeners. Many of these projects focus on special populations, including hearing-impaired adults, children with chronic otitis media, and cochlear implant users. Other projects focus on normal-hearing adults and children, with the goal of developing normative models of auditory processing and development. Experimental methods used in these studies include traditional psychophysical paradigms based on behavioral responses, such as detection or discrimination, as well as objective measures, such as surface-recorded evoked potentials and acoustic reflex. In many cases the resulting data can be incorporated into a computer-based model that formally characterizes different stages of auditory processing.



Dr. Emily Buss

Dr. Buss is currently working on research initiatives aimed at understanding the effect of OME on the utilization of speech cues in masking noise, central neural plasticity in response to peripheral hearing loss, the importance of temporal cues in speech understanding, and the role of amplitude modulation across frequency in parsing a sound scene. In the past year work has begun on the use of internal noise to model the development of auditory processing in school-aged children.

In addition to this laboratory work, Dr. Buss maintains an ongoing involvement in a number of cochlear implant investigations, for which she provides support in experimental design and analysis. She is also involved in a multidisciplinary study with UNC's Department of Psychology using fMRI to characterize the cortical representation of sound in patients with normal hearing and with hearing loss.



The Manis Lab: Jaime Mancilla, PhD; Deepti Rao; Luke Campagnola; Paul Manis, PhD; Beom Cho Jun, MD, PhD; Ruili Xie, PhD; Gontran Aljure; Eveleen Randall. Those not pictured who also work in the Manis Lab are Heather O'Donohue and Alex Rich, as well as ENT residents Gregory Basura, MD, PhD; and Joseph Roche, MD.

Paul B. Manis, PhD, and his colleagues are studying cellular mechanisms of information processing in the central auditory system. The research has two principal goals. The first goal is to understand the normal cellular mechanisms and the organization and function of neural networks that are responsible for the remarkable sensory abilities of the auditory system. The second goal is to understand how these mechanisms are affected by hearing loss, and how they may contribute to tinnitus. This work is currently supported by 2 NIH R01 grants to Dr. Manis, and grants to Drs. Greg Basura and Joseph Roche.

In the first project, Dr. Manis and Dr. Jaime Mancilla, are studying the physiology of the dorsal cochlear nucleus. The dorsal cochlear nucleus (DCN) is a site for rapid and early processing of spectrally complex acoustic stimuli, and is the first point in the auditory system where auditory and non-auditory information converges. Increased spontaneous activity in the DCN after hearing loss has also been associated with central *tinnitus* (perception of a phantom sound) after noise-induced hearing loss. Increased activity of DCN neurons can be caused by increased electrical excitability or decreased inhibition, and thus these are potential mechanisms for tinnitus. While the responses of DCN principal neurons (called pyramidal cells) to sound are strongly molded by inhibition, little is known about the functional operation of the major inhibitory networks. The goals of this project are to investigate inhibitory circuits in the DCN, and to elucidate their roles in normal sensory processing as well as in auditory dysfunction. In the first aim, we are studying the organization and synaptic dynamics of the two major inhibitory circuits in the DCN, using paired whole-cell recording. We are examining whether the synaptic influence of the most populous inhibitory interneurons, the

cartwheel cells, depends on the target cell type, and whether cartwheel cells can fire in a synchronized manner as predicted from their physiology and connections. We are studying the spatial organization of cartwheel cell axons to determine whether and how this system, which receives non-tonotopic inputs, might operate in a tonotopic fashion. These experiments include morphological reconstruction of cell pairs to determine the spatial organization of local connections. In the second aim, we are investigating short (seconds) and long-term (hours) synaptic plasticity at inhibitory synapses in the DCN. We will test whether cartwheel cells utilize glycine and GABA as co-transmitters onto the pyramidal cells and other cartwheel cells, and whether there is activity-dependent short-term modulation of inhibitory synapses. We are also testing whether the inhibitory synapses from cartwheel to pyramidal cells, and the synapses between cartwheel cells, can undergo similar activity-dependent plastic changes. In the third aim, we are using our data on electrical excitability and synaptic function to create a biologically accurate circuit model of the DCN. We will use this model to test predictions about how changes in synaptic function associated with hearing loss can affect the output of the nucleus. In the fourth aim, we are testing (using a rat model system) whether noise-induced central tinnitus is associated with decreases in inhibitory synaptic strength, or with increased intrinsic electrical excitability. These experiments will test whether changes in intracellular chloride regulation, consequent to changes in activity after hearing loss, will alter the behavior of inhibitory networks and the strength of inhibition, thus leading to abnormal activity and the perception of a phantom sound. Tinnitus is a phenomenon that affects nearly 20% of people in the U.S., and which is debilitating to nearly 2 million citizens. There is a significant unmet need for effective treatments. Our experiments will directly evaluate specific synaptic systems and receptors that can be targeted for pharmacological intervention for treatment and cure of this persistent problem.

In a second research project, Dr. Manis, along with Dr. Ruili Xie, Mr. Luke Campagnola (Neurobiology graduate student) and Mr. Alexander Rich (MS4 at UNC), are investigating the integrative mechanisms of anterior ventral cochlear nucleus (AVCN) bushy and stellate neurons in normal animals, and in animals experiencing chronic hearing loss. These cells are part of a major set of pathways that are important in both speech perception and for sound localization. There are 3 sets of experiments. In the first aim, we are testing explicit hypotheses about the subthreshold integrative mechanisms of AVCN bushy neurons using in vitro methods and dynamic clamp to apply realistic patterns of synaptic conductance changes that represent the activity expected with acoustic stimulation. We are examining ideas about how the specialized potassium conductances found in auditory neurons contributes to integration of synaptic inputs using a new method called “dynamic clamp”. In the second aim, we are testing the hypothesis that the two primary sources of inhibition to bushy cells utilize synapses with different release properties and temporal dynamics. We are also testing whether inhibition is necessary to improve temporal fidelity of timing information, and whether inhibition helps to provide a sparse code to more central synapses. We are documenting

the organization of the functional circuitry within the AVCN through paired recordings between inhibitory interneurons and principal neurons. In the third aim, we are examining the effects of hearing loss on synaptic transmission at both excitatory and inhibitory synaptic inputs in a mouse model. We are testing the hypothesis that hearing loss causes the postsynaptic receptors to return to an immature state, e.g., similar to the receptor expression pattern seen during early development. With Ms. Eveleen Randall (MS2 at UNC) and Ms. Heather O'Donohue, we are also investigating the more speculative hypothesis that there are compensatory changes in nicotinic cholinergic receptor function in the AVCN, since there is evidence that innervation of the cochlear nucleus by cholinergic afferents may be increased after profound hearing loss that includes loss of spiral ganglion cells. This work is also dovetailing with the UNC Proteomics Core and Dr. Xian Chen, to look at other proteins that may change in the cochlear nucleus and inferior colliculus with hearing loss. These experiments will help us understand how information is processed in the central auditory system under normal hearing conditions, and will shed light on functional and cellular changes in central processing that occur in hearing loss and deafness. Understanding these dynamic changes is an essential step toward developing compensatory or corrective strategies to restore hearing and optimize auditory communication in the face of hair cell and ganglion cell loss.

In a related set of experiments, Dr. Manis' lab is examining the effects of age-related hearing loss on central processing in mice. The DBA strain of mice exhibits a highly reproducible early-onset high frequency hearing loss of peripheral origin. Dr. Yong Wang, a past member of the lab, found that cells in the high frequency regions of the cochlear nuclei of these mice undergo changes in their synaptic communication with



Drs. Paul Manis and Jaime Mancilla

the auditory nerve. We are excited about these results, and the experiments may have implications for understanding how best to treat patients with significant hearing loss. Dr. Wang has recently moved on to take a faculty position in the department of Otolaryngology/HNS at the University of Utah.

Auditory information processed by the brainstem and midbrain auditory nuclei is ultimately analyzed in the auditory cortex, which consists of a core or primary region and several highly interconnected surrounding areas defined by tonotopic organization and acoustic responsiveness. Recent studies have shown that the primary auditory cortex is highly plastic, and that the properties of the cells can be modified by relevant interactions between the organism and its environment. Furthermore, it has become evident that sensory cortex not only processes sensory information, but also plays an active role in the recall of prior sensory experience. This has led to a new line of research in the laboratory that has now received additional funding from the Deafness Research Foundation (to Dr. Greg Basura, a resident in the laboratory), to study the consequences of hearing loss on cellular processing in auditory cortex, and to study the potential role of serotonergic receptors in modulating hearing-loss induced plasticity. Ms. Deepti Rao, a graduate student from Cell and Molecular Physiology, is also working on this project. The lab is also interested in investigating synaptic changes that are associated with learning and memory in the auditory cortex. Ms. Deepti Rao and Dr. Joe Roche are also investigating the mechanisms and functional significance of spike timing dependent plasticity, which is thought to be a learning rule that maximizes mutual information between inputs and outputs of simple neural networks. Dr. Joe Roche along with Dr. Manis will also be studying the development of spike timing dependent plasticity and how it is affected by sensorineural hearing loss (Dr. Roche has been awarded the AAO-HNS/ANS Herbert Silverstein Otology and Neurotology Research Award).

Lastly, a project examining inhibitory circuits and their role in regulating gamma rhythms in the auditory cortex in a mouse model of schizophrenia is supported through the UNC Conte Center.

Charles C. Finley, PhD, is a biomedical engineer and neurobiologist, who investigates the design and application of cochlear implant systems. His work includes clinically-based issues such as speech processor design and fitting, as well as *in situ* device evaluation. He also pursues basic research in understanding the anatomical and physiological basis for variable speech reception outcomes across patients.

This latter area of work involves the integration of high-resolution CT imaging, measurement of intracochlear evoked potentials and computer modeling to make predictions about the neural responsiveness and neural survival patterns in various regions of an individual patient's implanted cochlea. This multidisciplinary

work is being pursued in patients with the Clarion and Nucleus implant systems in collaboration with investigators at Washington University in St. Louis. In this study patients are being assessed pre- and post-operatively using high-resolution CT techniques to determine cochlear anatomy and electrode placement. Peripheral intracochlear physiological responses are also being measured to characterize the status of the cochlea. As part of this project, techniques are also being developed to derive an anatomically-based, finite-element, cochlear model for each individual patient using the CT anatomical information. This computational model will interface with a neural response model and will be used to help interpret intracochlear evoked response data to provide insight into neural survival patterns. Finley's work in this area was recently recognized by the UNC-CH/NCSU/Duke Renaissance Computing Institute (RENCI) with the competitive award of a RENCI Faculty Fellowship for the academic year 2007-2008. During the year Finley worked with four colleagues at RENCI to implement and expand his model system which includes a full head, a detailed temporal bone and a high-resolution cochlea with implanted electrode array. The model system is implemented on various high performance computer clusters at RENCI. This latter study is motivated by the CT observations to date which show that surgical variation in electrode placement across patients regarding depth of insertion and scalar positioning each significantly influence speech reception performance. This observation was reported by Finley and colleagues in *Otology and Neurotology* this year and has resulted in new emphasis by surgeons and manufacturers to improve electrode insertion techniques. Indicative of the broad interest by the implant community in this work, Finley received an award for best conference paper at the Eight European Investigator's Conference in Marrakech, Morocco in March 2008, sponsored by Advanced Bionics Corporation.

Development of generic methods of monitoring and evaluating the functional performance of implanted cochlear implant systems in patients continues in Dr. Finley's lab. In recent years this work spawned a series of basic science studies investigating the patterns of electrical artifact potentials appearing on the scalp of cochlear implant patients. Careful measurement, analysis and modeling of these electrical potential patterns has provided new insights into the pathways along which stimulation current flows during normal operation of cochlear implant systems. Of particular significance is the observation that the current flow pathways for apical and basal stimulation sites are significantly different contrary to conventional wisdom. This observation has served as a key piece of information to link disparate findings from CT imaging, intracochlear electrophysiological measures and psychophysical perceptions to hypothesize the existence of a stimulation mechanism that leads to ectopic stimulation of the auditory nerve in the internal meatus during intracochlear stimulation. This effect is thought to be a significant factor limiting the speech reception abilities of lower performing implant subjects. Several new stimulation strategies have been developed to alleviate this phenomenon and are presently being tested in patients.

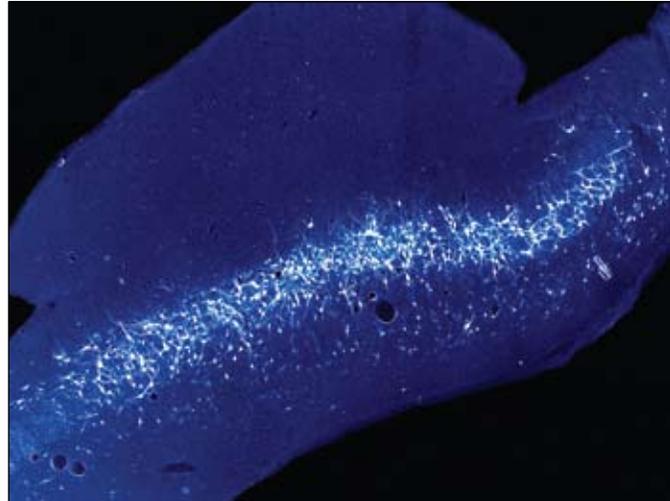
Finley's studies of electrical artifact patterns also have significant clinical utility in monitoring cochlear implant device function *in situ*. The FDA has recently approached Finley to apply his techniques in a multicenter, multidevice study of the impact of device failures on speech recognition outcomes in children. Finley is also applying similar techniques to study electrical stimulation mechanisms in blind patients implanted with a retinal prosthesis in collaboration with a device manufacturer. An additional area of activity for the next year will be a new NIH-funded project in collaboration with Dr. Fitzpatrick to explore basic science questions related to encoding of speech information using direct electrical stimulation applied to the inferior colliculus.



Dr. Doug Fitzpatrick, Steve Pulver, Katherine Sebastian, and Dr. Jiri Prazma. Katherine is a 2nd year medical student working in Dr. Fitzpatrick's lab as part of the NIH training grant.

Douglas C. Fitzpatrick, PhD, and his colleagues study the neuronal basis of binaural hearing. The two ears encode the frequency and timing of sounds, and dedicated neural pathways then compare the information from the two sides to improve the signal to noise ratio and to extract specific information such as the location of the sound source. The difference in the time of arrival of sounds at each ear is a major binaural cue for localizing sounds on the azimuth. Human listeners can discriminate interaural time differences (ITDs) as small as 10-20 microseconds, or about 1/100 the width of a single action potential. As might be expected, the neural basis for discriminating ITDs has received considerable attention. Our approach has been to combine neurophysiological and behavioral techniques to measure the thresholds for ITD discrimination achieved by neurons for comparison with human behavioral thresholds and with behavioral thresholds measured in the species from which the neurons are recorded. In addition, we are applying our basic understanding of binaural

processing and the auditory system to test devices that may be used to provide hearing to the deaf. Some subjects are not candidates for cochlear implants because their condition has not left a patent auditory nerve. In these individuals the only way to provide auditory input is through stimulation of the central auditory system. We are using our animal model to test the feasibility of an implant in the auditory midbrain.



The tectal longitudinal column (TLC) is a newly discovered auditory nucleus that runs between the inferior and superior colliculi in the midbrain. This sagittal section through the midbrain of the rat shows cells in the TLC that have been fluorescently labeled following an injection of a tracer substance into the superior olivary complex. A study published this past year was the first to describe the anatomy and physiology of the TLC (Saldaña et al., 2007), and a study in press describes the physiology in more detail (Marshall et al., 2008).

This past year we made progress in understanding the ability of neurons in the inferior colliculus and auditory cortex or rabbits to follow temporal fluctuations of the ITD, such as would be associated with a moving sound source. Currently, the literature suggests a mismatch between behavioral and neural results, with behavioral measurements suggesting the binaural system is slow, or “sluggish”, while the neurons show no such sluggishness. However, physiological experiments have generally used a different methodology and have not been done at the cortical level. Because binaural sluggishness is measured relative to the ability to encode fluctuating cues in monaural channels, such as amplitude modulation (AM), our experiments compare neural responses to modulation of the ITD or of AM. We also perform parallel behavioral experiments in rabbits to determine if they show binaural sluggishness as seen behaviorally in humans. To date, we have not observed differences in the ability of neurons to follow temporal modulations of the ITD or AM. Significantly, our preliminary behavioral results also show no differences in temporal processing of these two signals. Consequently, our current hypothesis is that binaural sluggishness is not due to an inherent limitation in processing binaural signals, but rather an enhancement in processing AM in humans compared to rabbits. This enhancement is likely to be the result of the need to encode AM for extracting information in complex signals such as speech.

This work is being done in collaboration with the psychoacousticians (Drs. Joe Hall, John Grose and Emily Buss) and has benefited from the participation of medical (Jason Roberts and Katherine Sebastian) and undergraduate (Stuart Owens) students.

We have continued a project previously supported by the Advanced Bionics Corporation to investigate the ability of an implant in the midbrain rather than cochlea to provide

the percept of hearing. We successfully implanted multichannel electrodes in the IC of rabbits, and have measured neural and behavioral thresholds to stimulation of the implant. The major result to date is that the neural and behavioral thresholds are in close agreement. Future work in this project will be to determine the ability of the rabbits to detect cues for speech such as formant frequency and voice onset time based on electrical stimulation of the IC. This work is being done in collaboration with Dr. Charles Finley.

As always, Stephen Pulver has provided superb technical assistance throughout the year.

Carlton J. Zdanski, MD, describes his role as researcher in a variety of settings:

Through the concerted efforts of many individuals within the Department of Otolaryngology/Head and Neck Surgery, The Department of Pediatrics, and multiple individuals within the University of North Carolinas Hospitals system, we have been awarded a generous grant from The Duke Endowment for the formation of the North Carolina Children's Airway Center. The Airway Center specializes in the coordinated delivery of cutting edge, multi-disciplinary, specialized care for children with airway disorders. The Center will also seek to educate patients and their families as well as clinicians regarding airway disorders and to perform research. The Center's multi-disciplinary clinics began formally seeing patients in September of 2007. Multiple areas of research are currently being explored and protocols for efficient and safe evaluation and management of more common airway problems are being developed and fine tuned.

In the laboratory with Drs. Jiri Prazma and Allen Marshall, we continue to examine the problem of subglottic stenosis of the airway in the pediatric population and to examine etiologies and diagnostic tools for Meniere's Disease. Research into the mechanisms of otitis media, continue in the laboratory with Drs. Ebert, Blanks, Eapen, and Prazma examining the role of immunomodulatory oligonucleotides in the prevention and treatment of OVA-induced Eustachian tube dysfunction.

Additional clinical research in the area of the Pediatric Airway has been in collaboration with Dr. Amelia Drake. We investigated the social impact of tracheotomies on school aged children.

Clinical research has primarily revolved around our excellent Pediatric Cochlear Implant Program at UNC. This is one of the most active pediatric cochlear implant programs in the country. Our Internal Review Board approved protocol for the study to determine the optimal protocol for the auditory rehabilitation of children with Auditory Neuropathy/Dys-synchrony continues and data collection continues. These data were

again presented at international meetings, this time in San Diego, California. Our group was also privileged to write about our philosophy and share some of our data for a chapter in an upcoming book. Interest has been intense on an international level and across disciplines. We plan to continue to collect, present, and publish our data on as it matures.

Jiri Prazma, MD, PhD, and his colleagues have continued in their study of allergy-induced Eustachian tube dysfunction. The role of allergy in the development of Eustachian tube dysfunction (ETD) and otitis media with effusion (OME) has been investigated in the laboratory for many years. While the etiology of OME most likely involves many factors, allergic inflammation in and around the nasopharyngeal portion of the Eustachian tube (ET) or within the middle ear leads to the breakdown of the protective functions of the ET, thereby resulting in increased risk for the development of otitis media. For this reason, it is theorized that by modulating the pathways that lead to the allergic response, we can limit the inflammation caused by the allergic response resulting in ETD.

We have developed a model of ETD where rats are sensitized to ova-albumin (OVA) and subsequently challenged with this allergen either transtympanically or through the nasopharynx. This challenge causes an allergic-like response leading to inflammation within the middle or around the nasopharyngeal portion of the ET. This inflammation consequently leads to worsening of the ET's ventilatory function manifested as increased passive opening and closing pressures as well as worsening of active clearance of negative pressure. It also impairs the mucociliary clearance of the ET.

Supported by the Resident Research Grant of the American Academy of Otolaryngic Allergy, Rose J. Eapen, MD, resident in the research track, has investigated a new and influential mediator of allergic inflammation, immunomodulatory oligodeoxynucleotides (IMOs). Studies have shown that these types of oligodeoxynucleotides were efficacious in the treatment of allergic-like airway inflammation and airway hyperresponsiveness by preventing naive T-lymphocyte differentiation. In addition, IMOs demonstrated a potent effect on early and late phase allergic airway responses by reducing eosinophils, IL-10, IL-4, IL-5, and IL-6. However, there has been no research investigating the ability of these drugs to inhibit allergy induced OME. Dr. Eapen continues to investigate the role of allergy while middle ear effusions are induced by LPS administered into the middle ear in ovalbumin sensitized Brown Norway rats.

Conclusion: IMO given via transtympanic or nasopharyngeal application can treat allergy-induced ETD in rats. IMO may offer substantial promise in the future management of OME. Treatment with IMOs prevented OVA-induced allergic Eustachian tube inflammation in the rat and in the future may provide a useful agent in the management of allergy-induced OME in children. The role of ovalbumin-induced allergy on LPS-induced middle ear effusions are presently being investigated.

Craig A. Buchman, MD, is actively involved in research in a number of hearing-related topics. Together with a number of co-investigators from UNC and abroad, he is actively studying topics such as cochlear nerve deficiency, auditory neuropathy, CMV-related hearing loss, inner ear malformations, and a number of hearing restorative device-related topics. In the field of cochlear implantation, Dr. Buchman and colleagues have been studying the effects of combining electrical stimulation from a cochlear implant with the natural acoustic signal from patients with preserved residual hearing following implant surgery in an attempt to improve hearing performance for patients. Also, ongoing investigations continue into the safety and efficacy of bilateral cochlear implants as well as the reliability of a variety of cochlear implant devices in both adults and children. Newer areas of study include a clinical trial for auditory brainstem implants (ABI) in adults without NF2 and use of the round window membrane for implantation of the Vibrant MedEl device for conductive and mixed hearing losses.

Investigators at UNC continue to be very interested in the field of auditory neuropathy in children. Here at UNC, we have a particularly robust clinical experience with this disorder as we are currently following more than 130 affected children. What is clear from our current research is that the findings of auditory neuropathy on hearing testing can be associated with a variety of medical conditions. We have learned that some children with auditory neuropathy can occasionally have absent or severely deficient cochlear nerves on MRI and that these children may not benefit from hearing restorative interventions. By contrast, most children with auditory neuropathy can benefit from either hearing aids or cochlear implants depending on their native hearing abilities. Identifying which children can benefit from the various intervention strategies is a major area of investigation.

In the areas of basic research, Drs. Buchman, Adunka and Pillsbury have launched a new area of investigation at UNC, evaluating intracochlear trauma from cochlear implant surgery in the human temporal bone model. This is an extension of Dr. Adunka's previous work prior to coming to UNC and promises to help surgeons and scientists develop surgical techniques and electrode arrays for future use. Dr. Buchman also is involved in a project attempting to record auditory-evoked electrophysiological responses using an intracochlear device in an attempt to better characterize hair cell and neural populations.

Oliver F. Adunka, MD, started his appointment as Assistant Professor in July 2007 and continues to work on clinical and experimental topics in otology, neurotology, and lateral skull base surgery. His otologic research has a special focus on cochlear implantation. Dr. Adunka is the PI of the combined electric-acoustic stimulation (EAS) clinical trial. UNC is leading enrollment of this North American clinical trial, which evaluates safety and efficacy of combining electric and acoustic hearing. Dr. Adunka's research has also focused on other clinical topics of cochlear implantation and

sensorineural hearing loss. Together with Dr. Buchman, for example, he has helped to establish a clinical protocol for children with cochlear nerve deficiency.

Another main area of research has been the human temporal bone laboratory. Within the last year, the focus of this new lab has been to establish detailed protocols for this special sawing, grinding, and polishing technique. This method allows for sectioning of un-decalcified bone with hard materials such as cochlear implant electrode contacts left in situ. Thus, a very accurate and detailed assessment of cochlear implant electrode insertion trauma can be accomplished. The first temporal bones have been implanted for several investigations. Preliminary data will be available in the next few months.

Also, Dr. Adunka has established collaboration efforts with Dr. Narayan from the joint Department of Biomedical Engineering at UNC and NS State University. The primary goal of this collaboration is to develop a middle ear prosthesis using rapid prototyping. This research is currently ongoing and a new prosthesis design has been developed and will be evaluated in the human temporal bone laboratory.

Together with the Office of Technology Development at UNC, Dr. Buchman and Dr. Adunka have applied for a US and International Patent to provide intracochlear measurements of acoustically evoked auditory potentials. This new technology should provide improved means to monitor hearing during hearing preservation cochlear implantation. Also, this method might be helpful in the direct assessment of hair cell function rather than to gather in-direct data via conventional audiometric evaluation. The patent application has recently been published with the US Patent and Trademark Office.

Holly Teagle, AuD, is the primary investigator and coordinator for an NIH-funded study called Childhood Development after Cochlear Implantation (CDaCI). Cochlear implantation provides deaf children with access to sound, which is the first step in overcoming significant delays in receptive and expressive language development and the resultant cognitive and academic deficits. Psycho-social aspects of child development, including parent-child interactions and social development are also strongly influenced by significant hearing loss. The effects of deafness and the subsequent acquisition of sound through cochlear implantation on the “whole child” has been the focus of this multi-center study in which has recently been renewed for a second five year term. Drs. Pillsbury, Buchman, and Zdanski are the surgeons and Hannah Eskridge provides speech and language assessments on the project.

Robert A. Buckmire, MD, has several ongoing clinical and research projects involving voice and swallowing.

Projects determining the role for quantitative laryngeal electromyography (LEMG) are being conducted as a joint effort between the Department of Neurology and the Department of Otolaryngology. Dr. Robert Buckmire and Dr. James Howard, who staff the LEMG clinic, are conducting an evaluation of quantitative versus qualitative interpretations of the LEMGs in a blinded fashion.



Dr. Buckmire and Biomedical Engineering PhD candidate, Joe Giallo, testing a newly designed laser guidance device for microlaryngeal surgery.

The Voice center currently partners with both academic departments and local industry on research projects. In a collaborative effort with the Department of Biomedical engineering (UNC/NC State), The Voice Center is participating in developmental work regarding tumor border detection and microlaryngeal laser guidance techniques. Initial work with border detection was undertaken including the use of “active contours”. Active contours are computer-generated curves that move in order to determine the perimeter of an object located within an image. A current PhD thesis project is focused on the design and creation of improved laser guidance hardware and software for microlaryngeal surgery.

Both computer recognition algorithms and novel in vivo imaging techniques are being adapted for the purpose of developing “image guidance” in laryngeal surgery. In work

with Bioptogen, a RTP start-up company, optical coherence tomography (OCT) is being utilized to acquire real-time 2D and 3D images to aid in tumor border detection and to assess subepithelial anatomic detail.



Dr. Buckmire testing the new biorobotic laser control device with a “live fire” experiment.

Many additional clinic projects involving laryngeal surgical techniques, swallowing disorders and technique analysis in surgical treatment of post-treatment, head and neck cancer dysphagia are

underway. Several collaborative research efforts with the Division of Gastroenterology are also being pursued.

Additional clinical projects on the effects of pharyngo-esophageal dilation in chemo-radiation patients and multi-dimensional evaluation of voice outcomes following Gore-Tex thyroplasty will be presented at national and international meetings this year.

Marion Everett Couch, MD, PhD, and her colleagues continue to work on the mechanisms of cancer cachexia syndrome, a profound wasting syndrome, which affects many patients with advanced stage head and neck cancer. In collaboration with Albert Baldwin, PhD, Associate Director of the Lineberger Comprehensive Cancer Center, and Ashley Wysong, a Howard Hughes Medical Institute Fellow, selective NF- κ B inhibitors were used to reduce the inflammatory cascade that contributes to cancer cachexia. In a well-established animal model of cancer cachexia, two selective NF κ B inhibitors were used after the induction of cancer cachexia to reverse the muscle wasting seen. They had no toxic side effects in this short-term trial, and they prolonged survival in the animals. In addition, Ashley Wysong was able to collaborate with Monte Willis, MD, PhD, Assistant Professor in Pathology & Laboratory Medicine, to determine the cardiac effects of cachexia in this animal model. Their studies demonstrated that the function and structure of the heart were profoundly affected in a detrimental way in animals with cancer cachexia. The use of selective NF κ B inhibitors was able to reverse these effects. These findings may contribute to better understanding of why patients do not tolerate therapy, either medical or surgical, when they are suffering from cancer cachexia.



Drs. Couch and Weissler discuss findings on CT scans of a cancer patient.

In an effort to better define cancer cachexia, the metabolic profile was determined in an animal model using a new technology called Metabolomics. This is a platform that allows for the survey of 1,500 different metabolites using NMR spectroscopy. Cancer cachexia was found to be distinctly different from starvation and could be reversed with resection of the tumor. Tumor burden alone did not account for the metabolic perturbations either. These studies will help us determine the exact metabolic derangements that exist in this condition. In

addition, these findings can be used to create a panel of metabolic markers to better define this condition in animals and in patients with cancer cachexia. There is a clinical trial to collect serum from patients with and without cancer cachexia, and this work will be extended to other patient populations.

With collaborator Denis Guttridge, Associate Professor at Ohio State University, we published findings on the effects of chemotherapy on muscle atrophy. A commonly used chemotherapeutic agent, Cisplatin, was found to induce atrophy in both muscles and myotubule cultures, suggesting that a side effect of cancer treatment may be regulation of muscle wasting, and that this may be mediated via the NF κ B signaling pathway.

Michael Stadler, MD (PGY3), who was awarded an American Academy of Otolaryngology – Head & Neck Surgery Resident Research grant, completed work on the effect of toll-like receptor 4 function on the anti-tumor response of using an allogeneic granulocyte monocyte – colony stimulating factor (GM-CSF) secreting HER-2/neu expressing whole tumor cell vaccine. Mitchell Gore, MD, PhD (PGY3) was able to modulate the effects of cancer cachexia and tumor growth in an animal model by using toll-like receptor (TLR) 9 agonist and antagonists. He also looked at various pathways involved in muscle wasting, especially PI3-AKT pathway.

Andrew F. Olshan, PhD, and **Mark C. Weissler, MD**, were funded in July of 2001 by the National Cancer Institute to conduct a study (The CHANCE study) in 46 counties in North Carolina to comprehensively evaluate the role of genetic susceptibility factors in the etiology of squamous cell carcinoma of the head and neck. The population-based case-control study will include 1,300 cases and 1,300 controls and will constitute the largest study of head and neck cancer ever conducted in the United States. Polymorphisms of genes representing metabolism (activation and detoxification) of carcinogens and nutrients, mediators of oxidative stress, and DNA repair will be investigated using a 1,536 single nucleotide polymorphism (SNP) array. The size and population-based design should allow the investigators to more confidently confirm or reject associations raised in previous studies. The study will also collect tumor blocks for future studies of “downstream” somatic alterations of tumor suppressor genes and oncogenes. The basic data collection phase was completed in June 2006 and initial analyses are underway. Drs. Olshan and Weissler have also conducted a pilot study to evaluate survivorship factors, including quality of life, among cases in the CHANCE study. Cases were interviewed again eight months after diagnosis about smoking habits, access to health care, and quality of life issues. This work has led to the award of a grant from the Lance Armstrong Foundation to continue to collect data on quality of life among African-American head and neck cancer survivors.

Dr. Olshan also continues to collaborate with Dr. Weissler on analyses of gene-environment interaction and head and neck cancer using samples from a previously conducted case-control study conducted at UNC Hospitals.

Lance Armstrong Foundation Grant

Treatment for head and neck cancer is particularly aggressive, affecting speech, swallowing, breathing and communication. A grant from the Lance Armstrong Foundation to the University of North Carolina at Chapel Hill will fund research on the experiences of head and neck cancer survivors, so that health professionals can effectively manage the impact of treatment on a patient's social, family and work roles.

The three-year, \$246,760 grant was awarded to Dr. Andy Olshan, Professor and Chair of Epidemiology in the UNC School of Public Health and Principal Investigator of the study. Olshan is also a research professor in the School of Medicine's Department of Otolaryngology/Head and Neck Surgery and program leader for cancer epidemiology in the UNC Lineberger Comprehensive Cancer Center.

Because quality of life outcomes are especially critical for head and neck cancer (oral, pharyngeal, laryngeal) patients and their caregivers, more research is needed on the experiences of survivors, especially among black patients, Olshan said. The study will examine the influence of social, clinical, access to care, and behavioral factors on quality of life. Blacks have a higher incidence and worse survival than other groups.

"Given the paucity of data and studies on quality of life among African-American head and neck cancer survivors we expect this study to yield valuable new data," Olshan said. Olshan and his colleagues will analyze data collected for the Carolina Head and Neck Cancer Study (CHANCE), the largest epidemiologic study of squamous cell carcinoma of the head and neck in the United States and the first to include a significant number of black patients. Patient information will be collected one year after diagnosis and three years after diagnosis. Data collection for the quality of life study will be complete in six months. The CHANCE study, which is ongoing, is funded by the National Cancer Institute.

Pilot funds for the quality of life work were obtained from the Excellence Fund of the School of Medicine. CHANCE collaborators include Drs. Mark Weissler, JP Riddle Distinguished Professor of Otolaryngology/Head and Neck Surgery; William Funkhouser, Professor of Pathology; and Jianwen Cai, Professor and Associate Chair of Biostatistics in the UNC School of Public Health. The Lance Armstrong Foundation, founded in 1997 by cancer survivor and champion cyclist Lance Armstrong, is a nonprofit organization located in Austin, Texas.

Since his return to UNC, **Adam M. Zanation, MD**, has wasted no time in initiating cutting-edge research in the area of Skull Base Surgery and Oncology. His passion for research began in residency and continues to grow as he embarks his career in a new surgical specialty in Otolaryngology. Dr. Zanation has involved residents, Mihir Patel, Rupali Shah, and Josh Surowitz in studies investigating novel techniques in this area. His latest projects include use of the endoscopic pericranial flap in skull base reconstruction and the use of the nasoseptal flap in skull base reconstruction of pediatric patients. Both projects employ radioanatomic analysis for optimal surgical design of these reconstructive techniques. They are also both being considered for resident research awards and will be presented at the upcoming Triological Society meeting. Dr. Zanation promises to be an outstanding physician-scientist with research contributions at the forefront of Skull Base Surgery and Oncology.



Drs. Adam Zanation, Joshua Surowitz, Mihir Patel, and Rupali Shah

Carol G. Shores, MD, PhD, is conducting several studies in the pathogenesis, diagnosis and treatment of head and neck squamous cell carcinoma (HNSCC) within the Head and Neck Cancer Lab.

In collaboration with Dr. Paula Harmon, Dr. Shores has just completed tissue collection on a study of the response of Epstein-Barr Virus to chemotherapy in children with Burkett's lymphoma in Malawi, Africa. Preliminary results were presented at the American Head and Neck Society meeting in July of 2008 and final analysis of the data will be finished in the fall of 2008.

Drs. Shores and Xiaoying Yin continue to examine the mechanism of chemosensitization of radiation by different chemotherapy agents in tissue culture and animal models. This work is supported by grants from Eli Lilly and Biogen Idec (formally Conforma Therapeutics). This exciting work may lay the groundwork for future phase 1 clinical trials.

In an ongoing collaboration with our newest faculty member, Dr. Adam Zanation, Dr. Shores helps to direct a study of gene and protein expression in well differentiated thyroid carcinoma to improve accuracy of fine needle aspiration biopsies. This study being conducted by Drs. Mihir Patel and Rupali Shah and is open at both UNC and WakeMed.

Drs. Trinitia Cannon and Mihir Patel presented a retrospective review of the use of liver function tests to predict liver metastasis in over 700 UNC head and neck cancer patients. These tests do not predict liver metastasis and were found to be unnecessary in most cases of newly diagnosed head and neck squamous cell carcinoma. The data was presented at the 2008 American Head and Neck Society meeting.

Xiaoying Yin, MD, is working on several research projects.

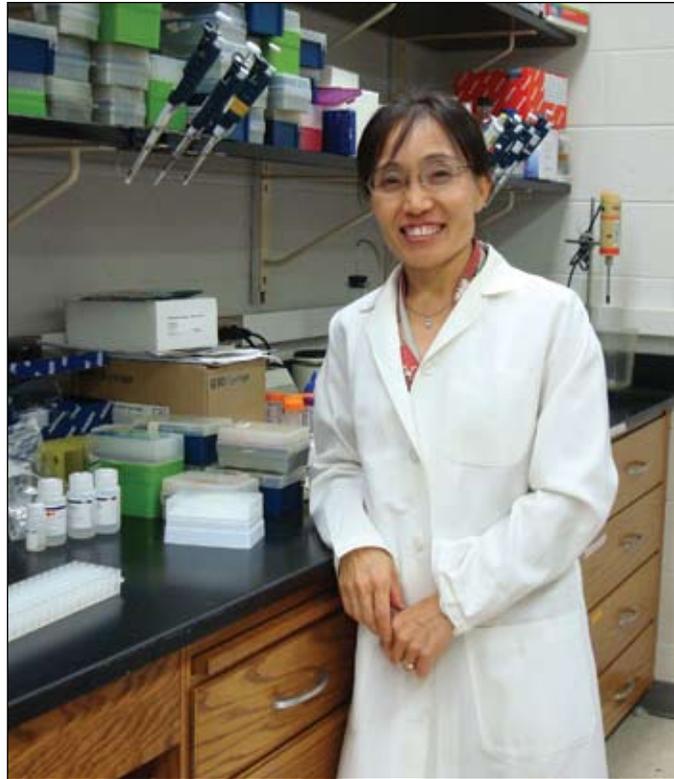
1. Evaluate the anti-tumor effect of enzastaurin, a PKC- β inhibitors on HNSCC. Protein kinase C (PKC) is a family of serine/threonine kinases known to play critical roles in the signal transduction pathways involved in growth factor response, cell proliferation, differentiation, and apoptosis. Therefore, the PKCs are potential targets for cancer therapies. Enzastaurin is a specific protein kinase C beta (PKC- β) inhibitor that has been reported effective for inhibiting tumor growth in many other tumor types. In addition to specifically inhibiting tumor-derived VEGF-induced angiogenesis, it has been reported that enzastaurin can directly inhibit proliferation, and induce apoptosis which will inhibit tumor growth *in vitro* and *in vivo*. Our research project are aimed to (1) evaluate the effect of enzastaurin on HNSCC as an antitumor agent alone and as a radiosensitizer with radiation both *in vitro* with HNSCC cell lines and *in vivo* using a novel mice model that mimics the delivery of concurrent chemoradiation in HNSCC patients, (2) help unravel the mechanism of the effect of enzastaurin and cisplatin by analyzing enzastaurin/cisplatin- induced protein level changes in signal transduction pathways and gene expression changes that are due to enzastaurin/cisplatin and radiation treatment, and (3) refine this murine model of chemoradiation responsiveness for use with other novel agents.

2. Microarray study of head and neck squamous cell carcinoma (HNSCC). Microarray technology has been widely used for comprehensive gene expression analysis. Large scale microarray analysis enabled us to analyze simultaneous changes of the

expression of thousands of genes in a single experiment and identify significant patterns. In HNSCC, gene expression signatures have been reported to associate with carcinogenesis, metastasis potential and recurrent disease. However, none of these are large scale studies.

Working with Carol G. Shores, MD, PhD, and Neil Hayes, MD (Division of Medical Oncology), we have collected hundreds of HNSCCA tumors from patients at UNC. Using this tissue bank, we are generating microarray expression data of these tumors. Our goal is using gene expression profile to help us to find genes that are important to response to radiation/chemotherapy, tumor

progress and metastasis, and tumor subtypes. In addition, we will use this tissue bank to perform single-nucleotide polymorphism array analysis of HNSCCA.



Dr. Xiaoying Yin

3. Evaluate the anti-tumor effect of Hsp90 inhibitors on HNSCC. Collaborating with Biogen Idec Corporation, we have studied a novel class of chemotherapy agents, Hsp90 inhibitors, EC78. Hsp90 stabilizes cellular proteins, and inhibition can lead to the degradation of several tumor related proteins, thereby interrupting several pathways simultaneously. The Hsp90 inhibitor EC78 has been shown to radiosensitize HNSCC in a xenograft model, with minimal side effects and disruption of the expected proteins.

4. Investigate the mechanism of cancer cachexia. With Marion E. Couch, MD, PhD, several residents and medical students, we are working on the mechanism of cancer cachexia syndrome, a wasting syndrome which afflicts so many cancer patients. The contribution of both the host and the tumor to cancer cachexia is being actively investigated. The laboratory has published work describing a head and neck animal model for cancer cachexia and work implicating the innate immune system (Toll-like receptors) in the severity of the wasting syndrome.

GRANTS

Spectral Profile Cues and Synthetic Listening

Principal Investigator: Emily Buss
NIH/NIDCD
12/15/05 – 11/30/10
\$119,797 current year

Development and Plasticity in Normal and Impaired Ears

Principal Investigator: Joseph Hall
Co-Investigator: Emily Buss
NIH/NIDCD
09/01/86 – 08/31/12
\$212,500 current year

Spectro-Temporal Analysis in Normal and Impaired Ears

Principal Investigator: Joseph Hall
Co-Investigator: Emily Buss
NIH/NIDCD
09/01/86 – 07/31/09
\$215,711 current year

Complex Sound Analysis in Normal and Impaired Ears

Principal Investigator: John Grose
Co-Investigators: Emily Buss, Charles Finley
NIH/NIDCD
12/01/92 – 08/31/13
\$212,500 current year

Research Training in Otolaryngology

Principal Investigator: Paul Manis
NIDCD
07/01/03 – 06/30/08
\$596,863 total direct costs

Research Training in the Neurosciences

Principal Investigator: Paul Manis
NIMH/NINDS Joint Program Grant
07/01/03 – 06/30/08
\$1,676,010 total direct costs

Physiology of the Dorsal Cochlear Nucleus Molecular Layer

Principal Investigator: Paul Manis
NIDCD
12/06 – 06/11
\$1,250,000 total direct costs

Cellular Mechanisms of Auditory Information Processing

Principal Investigator: Paul Manis

NIDCD

04/01/06 – 08/31/09

\$637,500

Allogeneic, Genetically-Engineered Tumor Vaccine

Principal Investigator: Marion Couch

University of North Carolina Program in Translational Science

July 2006 – June 2008

\$266,000

Chronic Cough and Reflux Disease: A Randomized, Double-Blinded, Placebo Controlled Trial of High Dose Proton Pump Inhibition

Principal Investigator: Marion Couch

Astra-Zeneca Pilot Grant

01/01/05 – 12/30/07

\$195,000

Visualization of the Airway During Percutaneous Tracheostomies Using Ultrasound

Principal Investigator: Marion Couch

Co-Investigator: Paul Bryson

Cook Critical Care Pilot Grant

06/06 – 07/08

\$3,500

Quality of Life Among African-American Head and Neck Cancer Survivors

Principal Investigator: Andrew Olshan

Co-Investigators: Jianwen Cai

Collaborators: Mark Weissler, William Funkhouser

Lance Armstrong Foundation

2007-2010

\$81,837 current year

Gene-Environment Interaction in Head and Neck Cancer

Principal Investigator: Andrew Olshan

NIH

2001-2008

\$5,682,405

Molecular and Immunohistochemical Differentiation of Thyroid Follicular Lesions

Principal Investigator: Carol Shores

Co-Investigators: Adam Zanation, Mihir Patel

AHNS/AAO-HNSF Young Investigator Award

07/01/07 – 06/30/09

\$20,000 current year

Role of Adenosine in Chronic Rhinosinusitis

Principal Investigator: Xioyang Hua

Co-Investigator: Brent Senior

American Academy of Otolaryngology CORE

04/01/08 – 03/31/09

\$10,000

North Carolina Children's Airway Center

Principal Investigator: Carlton Zdanski
Duke Endowment
2007-2009
\$360,000

RENCI Faculty Fellowship

Principal Investigator: Charles Finley
Renaissance Computing Institute, University of North Carolina at Chapel Hill
06/07 – 05/08
\$50,000

The Inferior Colliculus as a Site of Electrical Stimulation

Principal Investigator: Doug Fitzpatrick
Co-Investigator: Charles Finley
NIH-NIDCD
12/08 – 11/10
\$275,000 total direct costs

Bilateral Cochlear Implantation in Children

Principal Investigator: Craig Buchman
Co-Investigators: Holly Teagle, Oliver Adunka, Carlton Zdanski, John Niparko, Jill Cinnici, Nancy Fink
Advanced Bionics Corporation
University of North Carolina at Chapel Hill (subsite)
03/19/08 – 03/18/11
\$66,871

Auditory Brainstem Implantation in Non-NF2 Patients

Principal Investigator: Craig Buchman
Co-Investigators: Marcia Clark Adunka, Holly Teagle, John Grose, Matt Ewend, Derald Brackmann, Jose Fayad, Marc Schwartz, Steve Otto
Cochlear Corporation
University of North Carolina at Chapel Hill (subsite)
(Devices and testing provided free of charge)

Vibrant Med EL Clinical Trial

Principal Investigator: Craig Buchman
Co-Investigators: Marcia Clark Adunka, Oliver Adunka, Harold Pillsbury
Sponsor: Med EL Corporation
09/21/07 – 09/21/10
\$56,000

Electroacoustic Stimulation

Principal Investigator: Oliver Adunka
Co-Investigators: Craig Buchman, Marcia Clark Adunka, Harold Pillsbury
Med EL Corporation
03/27/07 – 03/27/10
\$5,500

Childhood Development after Cochlear Implantation (CDaCI Study)

Coordinating Center: Johns Hopkins University

UNC Principal Investigator: Holly Teagle

UNC Co-Investigators: Carolyn Brown, Craig Buchman, Harold Pillsbury, Carlton Zdanski, Jennifer Woodard, Hannah Eskridge

NIH/NIDCD

08/01/07 – 07/30/12

\$523,541

Children's Hearing Intervention Program; Center for Acquisition of Spoken language Through Listening Enrichment (CASTLE)

Principal Investigator: Carolyn Brown

The Oberkotter Foundation

2001-2009

\$1,512,000

Center for Acquisition of Spoken language Through Listening Enrichment (CASTLE), Wilmington expansion site

Principal Investigator: Carolyn Brown

Cape Fear Memorial Foundation

2007-2009

\$225,000

Center for Acquisition of Spoken language Through Listening Enrichment (CASTLE), Statewide Expansion Project

Principal Investigator: Carolyn Brown

The Duke Endowment

2006-2008

\$300,000

Wake Children's Hearing Intervention Program

Principal Investigator: Carolyn Brown

The John Rex Endowment

2003-2008

\$103,171

DISTINGUISHED PROFESSORSHIPS

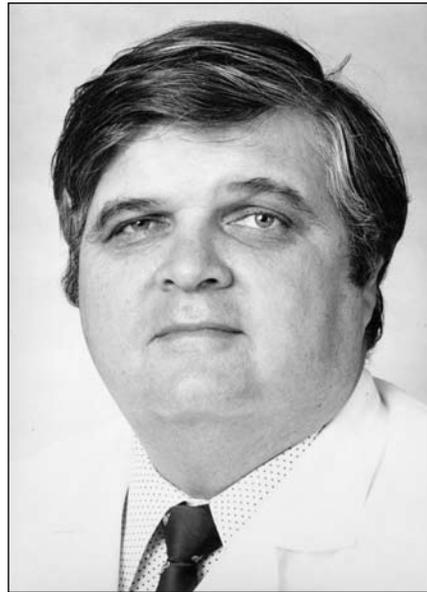
The distinguished professorships held by faculty in the department of Otolaryngology/Head and Neck Surgery:

The W. Paul Biggers Distinguished Professorship

The W. Paul Biggers Distinguished Professorship was established in 2000 to honor Dr. Biggers, who had been an integral part of the University of North Carolina since becoming a medical student in 1959.

Paul Biggers was born in 1937 in Charlotte, North Carolina, earned a B.S. at Davidson College and his M.D. at the University of North Carolina at Chapel Hill. He completed internship and residency also at UNC. In 1968 Dr. Biggers joined the faculty in Otolaryngology/Head and Neck Surgery at UNC.

Dr. Biggers offered an example of compassion, scholarly devotion, commitment to patient care, and teaching that is beyond compare. The numerous teaching awards bestowed upon him by the School of Medicine evidenced his contribution to medical teaching of students and residents.



W. Paul Biggers, MD

Beyond these contributions, Dr. Biggers had a lifetime interest in speech and language and served on the Board of Examiners for Speech and Language Pathologists and Audiology. Through tireless efforts, he ensured that the state legislature establish and continue a program designed to aid children with speech and hearing disorders. This program has already benefitted thousands of children within the State of North Carolina. For these efforts, he was presented the Service to Mankind Award and was honored with the H. Fleming Fuller Award as the outstanding clinician at the UNC Hospitals.

Established in 1992, the Carolina Children's Communicative Disorders Program (CCCDP) was made possible by Dr. Biggers' insight, perseverance, and generosity of spirit. This program is funded by the State of North Carolina and aids children with speech and hearing disorders. To honor him, the name was changed to the W. Paul Biggers, MD, Carolina Children's Communicative Disorders Program. Outside of the Division of Otolaryngology/Head and Neck Surgery, Dr. Biggers was very active within the University. He helped coach the football team and served on the

Executive Committee of the Board of Directors for the Educational Foundation. These accomplishments only begin to describe the service that Dr. Biggers provided to the State, the University, and to Otolaryngology/Head and Neck Surgery at UNC.

In recognition of Dr. Biggers' many contributions, the W. Paul Biggers Distinguished Professorship was established before he died in April of 2000 at the age of 62. Dr. Biggers asked that this Professorship be awarded to a physician who shares his passion for innovative teaching. On July 1, 2005, William W. Shockley, MD, was named the W. Paul Biggers Distinguished Professor of Otolaryngology/Head and Neck Surgery, to continue the tradition of excellence in patient care, compassion, teaching, and service that Dr. Biggers exemplified.

W. Paul Biggers Professor:
William W. Shockley, MD (2005-present)

The Thomas J. Dark Distinguished Professorship

The Thomas J. Dark Professorship in Otolaryngology was established in the University's School of Medicine in 1976 by Thomas Jefferson Dark of Siler City and Ft. Lauderdale, Florida.

The son of a Chatham County farmer, Dark was born in 1894. A member of the class of 1925, Dark studied in the University's School of Commerce — now the Kenan-Flagler Business School — and caught the attention and admiration of then-Dean Dudley



Thomas J. Dark

DeWitt Carroll and John Sprunt Hill of Durham, who built and gave The Carolina Inn to the University. Dark handled John Hill's business correspondence relating to the construction of the inn and, upon its completion, was kept on for another year as social manager.

After receiving a Certificate of Commerce from the University in 1925, he returned to Siler City, where he organized the community's first fire department and became its chief. He worked briefly for a chair company in High Point and an automobile company in Greensboro. Then Carroll recommended him for a sales job with Collins & Aikman Corp. of Roxboro and New York.

In 1940, he invested in a small manufacturing company, the Buchmann Spark-Wheel Corp.

When he became president, the company had 18 employees with varying levels of expertise in manufacturing small precision metal parts for cigarette lighters, toys, mining lamps and hardware. During World War II, under Dark's leadership, this small, obscure firm expanded, filling U.S. Army, Navy and Army Air Corps contracts for precision parts used in ordnance, radar and communications equipment for fighter and bomber planes. At this time, Dark purchased 3,000 acres of land near Athens, Georgia, and converted a rundown cotton plantation into a highly prized farm for raising Black Angus beef cattle. He continued both of these activities until his retirement in 1958.

Soon after his retirement, he bought a home in Ft. Lauderdale. He grew roses and raised bees in between recreational sailing trips. Because of family in North Carolina, he divided his time between Ft. Lauderdale and Siler City, with visits to his alma mater in Chapel Hill. An avid sports fan, he rarely missed a home football game in the last two decades of his life. He died in Siler City in 1987 at age 93.

In addition to establishing the Dark Professorship, he provided other gifts to the University, including a scholarship fund in the School of Medicine, a challenge gift to his classmates and a gift to establish an office for the Order of the Bell Tower in the new George Watts Hill Alumni Center. He also inspired his friend, Eunice Bernhard, to endow a professorship in the School of Medicine.

In recognition of his continuing loyalty and generosity, the School of Medicine presented him with its Distinguished Service Award in 1982.

Thomas J. Dark Professors:
Newton D. Fischer, MD (1977-1991)
Harold C. Pillsbury, III, MD (1991-present)

The Joseph Palmer Riddle Distinguished Professorship

The Joseph Palmer Riddle Distinguished Professorship in Otolaryngology was established in the University's School of Medicine in 1977 by a gift from Joseph Riddle.

Riddle was born in 1921 in Fayetteville. As the eldest son of a railroad conductor, he went to work at an early age at his family's gas station and country store. The long hours and minimal living conditions motivated the young Riddle to look to other opportunities for his future. He began working at the shipyard in Wilmington, where he met his future wife, March Floyd of Fairmont, N.C.

Riddle went on to serve for a time in the U.S. Navy. Afterwards, the newlyweds returned to Robeson County and Riddle began as a mail carrier. In 1952, Riddle, with the help of his father-in-law, began building homes in Cumberland County to respond to the

military growth in the area. His construction and development company, the March Development Corp., concentrated its building efforts on the boundaries of Fort Bragg. The company is credited with contributing to the growth explosion of Fayetteville's west side beginning in the 1960s. In addition, Riddle purchased and developed the 600-acre Cross Creek Mall area to transform his hometown into a major retail shopping center.

Riddle contributed substantially to projects that benefited education, medicine and quality of life in Fayetteville and at the University. Although not an alumnus, he was a member of the School of Medicine's Co-Founders Club and a vigorous and untiring force on the Medical Foundation Board of Directors. He also served on the Board of Directors of the Educational Foundation, which supports the University's athletic programs. He was one of a growing number of individuals whose gifts have gone to support both the academic and athletic programs of the University.

In addition to establishing the professorship, Riddle contributed funds to the Division of Cardiology in the Department of Medicine and the Division of Otolaryngology in the Department of Surgery. He provided needed funding for research associates and specialized scientific equipment for the Division of Cardiology. His support of the Otolaryngology Department led to advances in the study of otolaryngologic allergy and the establishment of an otolaryngology and microsurgery laboratory that bears his name.

Riddle's continued interest and support of medical programs at the University resulted in a substantial gift to the UNC-CH Lineberger Comprehensive Cancer Research Center. In recognition of his interest and support, he was presented the Distinguished Service Award by the School of Medicine in 1980.

Riddle and his wife, March, had three children: Sharlene (B.A. '84), Joseph III (B.S. '77) and Carolyn. Riddle died in 1995 at the age of 73.

Joseph Palmer Riddle Professors:
W. Paul Biggers, MD (1977-2000)
Mark C. Weissler, MD (2000-present)

The Newton D. Fischer Distinguished Professorship

The Newton D. Fischer Distinguished Professorship was established in 1993 to honor Fischer, a longtime medical school professor who established the Division of Otolaryngology/Head and Neck Surgery in 1952. It was created by the members of the Newton D. Fischer Society, who funded it, envisioning an ongoing contribution to academic otolaryngology.

Fischer was born in San Antonio in 1921. He earned three degrees from the University of Texas: a B.S. in 1942, a B.A. in 1943, and an M.D. in 1945. Fischer completed his residency at Johns Hopkins University, where he was an instructor for one year before coming to Chapel Hill in 1952. Fischer was the first Chief of Otolaryngology, a post he held for more than 30 years. He was among the first doctors to receive an otolaryngology training grant from the National Institutes of Health. In 1977, Fischer was named the Thomas J. Dark Distinguished Professor of Surgery, the chair he held until 1991.

Fischer is credited with helping the Division of Otolaryngology/Head and Neck Surgery achieve national prominence, widely recognized as one of the top 10 in training programs for residents in otolaryngology. Among the many residents Fischer trained is Harold C. Pillsbury III, who said of Fischer, "The loving care of a man of this depth is the sort of support an individual needs to really accomplish his best work."

Fischer's numerous awards include "The Professor" Award in 1977 and The Central Carolina Bank Excellence in Teaching Award in 1988. In 1984, he and his wife, Janet, a Sarah Graham Kenan Professor in the School of Medicine, won the Thomas Jefferson Award, which is given annually to the UNC-CH faculty member who best exemplifies the ideals and objectives of Jefferson through personal influence, teaching, writing and scholarship. Janet J. Fischer died after a courageous fight with breast cancer on February 24, 2007. At her memorial service, she was described by her grandson as "a remarkable woman who lived an extraordinary life."

Newton and Janet Fischer have five children: twins Jeannette (M.D. '81) and Amelia (M.D. '81), and Duncan, Anne (B.A. '83) and Helen (B.A. '81, M.A. '86), and eight grandchildren: Sarah, Jake, and Eva Stein; Luke, Kent, and Duncan Fischer; and Connor and Cliff Drake.

Newton D. Fischer Distinguished Professor:
Amelia F. Drake, MD (1998-present)



Drs. Newton and Janet Fischer

The June and James Ficklen Distinguished Professorship was established in 2008 to be awarded to a faculty member in the Department of Otolaryngology/Head and Neck Surgery.

In 2006, a Distinguished Professorship was established by an anonymous donor.

THE NEWTON D. FISCHER SOCIETY MEETING

The annual meeting of the Newton D. Fisher Society was held on June 7, 2008 at UNC's Paul J. Rizzo Conference Center at Meadowmont here in Chapel Hill. According to course director Dr. Austin Rose and meeting coordinator Dawn Wilson, it was a tremendous success. In addition to an excellent program, participants were particularly impressed with the outstanding meeting facilities at the Rizzo Center.

This year's meeting was a truly international one with speakers and attendees from as far away as Austria and India. The program also included a presentation by Dr. Josh Demke on the Department's role in helping to establish better cleft care for patients in the West Bank, Palestine. The keynote speaker was Dr. Stephen Park, the Director of Facial Plastic Surgery and Vice Chair at the University of Virginia, who gave an inspiring lecture entitled "Skin Cancer: Treatment and Reconstruction". In addition to a number of presentations by our own faculty and residents, the Department welcomed a number of speakers from other institutions including Dr. P. Chase Lay from Southern Illinois University, Dr. Christopher Melroy from the Georgia Nasal and Sinus Institute, Dr. Adam Zanation from the University of Pittsburgh and Dr. Antonius Kierner from Krankenhaus de Barmherzigen Bruder in Eisenstadt, Austria. Participants received 5.5 hours of AMA PRA Category 1 CME credit. The oral presentations are listed below:

Harold C. Pillsbury, MD: *Workforce Issues in Otolaryngology – Head and Neck Surgery*

William W. Shockley, MD: *What Ever Happened to the Lady with the First Face Transplant?*

Robert A. Buckmire, MD: *Laryngology Update 2008*

Joshua C. Demke, MD: *A Review of Cleft Care in the West Bank*

Rose J. Eapen, MD: *Hearing-in-Noise Benefits Following Bilateral Simultaneous Cochlear Implantation Continue to Improve Four Years After Implantation*

P. Chase Lay, MD: *Oculoplastic Procedures in Otolaryngology*

Stephen S. Park, MD(Keynote Speaker): *Skin Cancer: Treatment and Reconstruction*

Mark C. Weissler, MD; Marion E. Couch, MD, PhD; D. Neil Hayes, MD (Panel Discussion): *New Trends in the Treatment of Head and Neck Cancer*

Antonius C. Kierner, MD: *The Trapezius Muscle Innervation: An Anatomical Concept and Its Clinical Implication*

Adam M. Zanation, MD: *Endoscopic Minimally Invasive Skull Base Tumor Surgery*

Christopher T. Melroy, MD: *Balloon Catheter Frontal Sinusotomy Outcomes*

J. Gregory Staffel, MD: *documENT – A New Otolaryngology Specific EMR*

HONORS, AWARDS, AND ACHIEVEMENTS



Drs. Steve Lee, Karen Bednarski, Joshua Demke, and Jeffrey LaCour

The four chief residents who completed their training in Otolaryngology/Head and Neck Surgery in June of 2008 have all been awarded prestigious fellowships. Steve C. Lee, MD, PhD, went to the University of Pittsburgh Medical Center to do a combined two-year fellowship in Head and Neck Oncologic Surgery and Skull Base Surgery. Karen A. Bednarski, MD, is doing a fellowship in Rhinology with Dr. Fred Kuhn at the Georgia Nasal and Sinus Institute in Savannah. Joshua C. Demke, MD, went north to Syracuse, New York, to begin a fellowship in Facial Plastic/Reconstruction at SUNY Upstate with Drs. Robert Kellman and Sherard Tatum. Jeffrey B. LaCour, MD, is starting with a one-year fellowship at Pittsburgh Ear and Associates, followed by a year of Rhinology with Dr. Fred Kuhn at the Georgia Nasal and Sinus Institute in Savannah.

Two hundred UNC physicians have been named among the state's best doctors in the July 2008 issue of *Business North Carolina* magazine. The Best Doctors database contains the names and professional affiliations of approximately 40,000 doctors in the United States, all chosen through an exhaustive peer-review survey that asks: "If you or a loved one needed a doctor in your specialty, to whom would you refer them?"

According to *Business North Carolina*, the state's list is close to 50 percent longer this year than in the past, due to the record number of responses. There are 1,300 doctors listed, which is less than 5 percent of North Carolina's 29,000 licensed physicians. Yet seven from the UNC Department of Otolaryngology were chosen: Drs. Craig Buchman, Harold Pillsbury, Brent Senior, William Shockley, and Mark Weissler for Otolaryngology, and Drs. Amelia Drake and Carlton Zdanski for Pediatric Otolaryngology.

The 7th edition of Castle Connolly Medical, Inc., recognized Drs. Harold Pillsbury and Mark Weissler as "America's Top Doctors" in the specialty of Otolaryngology, and Dr. Amelia Drake in the specialty of Pediatric Otolaryngology. Dr. Weissler is also listed in the 3rd edition of "America's Top Doctors for Cancer." They were nominated by their peers in an extensive survey process of thousands of American doctors. They were screened by the Castle Connolly physician-led research team, and then were selected as among the very best in their specialties and in their community for inclusion in the published list of "America's Top Doctors."

Charles C. Finley, PhD, received the award for Best Oral Presentation at the 8th Advanced Bionics European Investigators' Conference held in Marrakech, Morocco, on March 8, 2008. This is an annual conference of European clinical and basic science investigators using the Advanced Bionics cochlear implant system. Two investigators from the USA, including Finley, were invited to participate and present their research this year. Finley's presentation, "Alternative fitting strategies based on peripheral electrode position", described his work with collaborators at Washington

University in St. Louis in determining how surgical variability in placement of intracochlear electrodes influences speech recognition outcomes. He further described how knowledge of electrode placement can be utilized to significantly improve individual patient performance by modification of speech processor fitting.

The North Carolina Children's Airway Center has been ranked 7th in the nation among the top 30 children's hospitals caring for children with respiratory disorders by *US News & World Report* in their 2008 issue of America's Best Children's Hospitals. Dr. Carlton Zdanski is the Surgical Director of this multidisciplinary center. Drs. Amelia Drake and Austin Rose are among the many who share in the care of pediatric patients with airway disorders at UNC.



Left to right are Professor Abdelhamid Benghalem (conference host), Mostapha Saadi (Advanced Bionics distributor in Morocco), Charles Finley, and Patrick Boyle (Director of Clinical Research Europe for Advanced Bionics).

Carlos S. Ebert, MD, received resident travel awards from both the American Academy of Otolaryngology and the American Academy of Otolaryngic Allergy to attend their annual meetings. Dr. Ebert has the honor of being a member of several committees within the American Academy of Otolaryngology-Head and Neck Surgery: Professional Liability Committee, Allergy and Immunology Committee, and the Outcomes Research and EBM Subcommittee.

Craig A. Buchman, MD, and Brent A. Senior, MD, were each awarded a Presidential Citation by Harold C. Pillsbury, MD, at the Triological Society Annual Meeting in Orlando, Florida, on May 1, 2008.

Amelia F. Drake was selected as a Senior Associate Fellow of the UNC School of Medicine's Academy of Educators. Dr. Pillsbury nominated her for this recognition of her educational accomplishments and her work with medical students. Drs. Marion Couch and Carol Shores became fellows last year.

Drs. Brent Senior, William Shockley, Carol Shores, Marion Couch, Craig Buchman, and Mark Weissler were among the ENT faculty involved in the "Structure and Function" anatomy course that has won the MSI Course of the Year Award, selected by the first year medical class, for each of the past four years.

Raymond D. Cook, MD, won a WakeMed Faculty Teaching Award for the academic year 2007-2008. This was presented at the annual banquet for residents and teaching awards at Wake Med in Raleigh.

Dr. Brent Senior, along with other members of Resource Exchange International (REI), was awarded a Medal for People's Health from the Minister of Health in Vietnam during his mission trip to Vietnam in August of 2007. Dr. Senior has been actively involved with the Vietnam Project since 1998 and has served as Director since 2004. The Minister recognized Dr. Senior's 10 years of service to the country of Vietnam, the many fellows from Vietnam he has supported to travel to the United States to learn from him at UNC, his role in the advances in the treatment of sinus diseases in Vietnam, as well as the hundreds of thousands of dollars worth of donated equipment. He also funds a scholarship that allows one UNC resident to go to Vietnam every year.



The Assistant Minister of Health for the Nation of Vietnam pins Dr. Senior during the awards ceremony when he received the Medal for People's Health. On the left is Madame Lein of REI Vietnam, followed by Dr. Jim Shroader (Northwestern University), and on the far right is Dr. David Parsons (Charlotte, NC). Lein and Parsons also received awards. (Photo by Dr. Harold Pine)

PRESENTATIONS

Adunka OF, Radeloff A, Pillsbury HC, Buchman CA. *Topography & Histology of the Scala Tympani Cochleostomy*. 10th International Conference on Cochlear Implants and Other Implantable Auditory Technologies, San Diego, CA. April 10-12, 2008.

Adunka OF, Adunka MC, Pillsbury HC, Buchman CA. *Cochlear Implantation in Patients with Substantial Residual Hearing*. Annual Meeting of the Triological Society, Orlando, FL. May 4, 2008.

Adunka MC, Buss E, Pillsbury HC, Adunka OF, Buchman CA. *Does Improved Cochlear Implant Engineering Lead to Improved Speech Perception?* Poster presentation, 10th International Conference on Cochlear Implants and Other Implantable Auditory Technologies, San Diego, CA. April 10-12, 2008.

Ardeshirpour F, Ladner KM, Bryson PC, Shores CG, Shockley WW. *The Use of Ultrasound in Defining Nasal Fractures*. Triological Southern Section Meeting, Naples, FL. January 11, 2008.

Bryson PC, Buckmire RA, Drake AF. *Congenital Laryngeal Atresia: Report of a Case of and Strategy for Laryngotracheal Reconstruction*. Poster presentation, American Society of Pediatric Otolaryngology, Combined Otolaryngology Spring Meeting, Orlando, FL. May 2008.

Bryson, PC. Kanapkey, B., Buckmire, RA, *Oropharyngeal Swallowing Dynamics in patients following Chemo-radiation therapy for Head And Neck Carcinoma*. Poster presentation, 7th International Conference on Head and Neck Cancer, San Francisco, CA. July 23, 2008.

Buchman CA, Roland JT, Hirsch BE, Francis H, Niparko J, Blakany TJ, O'Donoghue G, Gantz B, Young N. *Controversies in Pediatric Cochlear Implantation*. American Otolological Society, Orlando, FL. May 1, 2008.

Buchman CA, Adunka OF, Adunka MC, Pillsbury HC. *Electroacoustic Stimulation Using the Flexeas Array in Adults*. 10th International Conference on Cochlear Implants and Other Implantable Auditory Technologies, San Diego, CA. April 10-12, 2008.

Buchman CA, Ewend MG, Fayad J, Brackmann D, Schwartz M, Moorehead J, Menapace C. *Auditory Brainstem Implantation (ABI) in Patients without Neurofibromatosis Type 2*. 10th International Conference on Cochlear Implants and Other Implantable Auditory Technologies, San Diego, CA. April 10-12, 2008.

Buchman CA. *Scala Tympani Choleostomy*. Cochlear Corporation Symposium, 10th International Conference on Cochlear Implants and Other Implantable Auditory Technologies, San Diego, CA. April 9, 2008.

Buchman CA, Roush PA. *Auditory Neuropathy/Dys-synchrony in Children*. Annual Meeting of the American Academy of Audiology (Audiology NOW), Charlotte, NC. April 5, 2008.

- Buchman CA, Teagle HFB. *Controversies in Cochlear Implantation*. Annual Meeting of the American Academy of Audiology (Audiology NOW), Charlotte, NC. April 5, 2008.
- Buchman CA, Adunka OF, Adunka MC, Buss E, Pillsbury HC. *Cochlear Implantation in Patients with Substantial Residual Hearing*. Asia-Pacific Symposium on Cochlear Implants, Sydney, Australia. October 2007.
- Buchman CA, Ewend M, Fayad J, Brackmann D, Schwartz M, Moorehead J, Menapace C. *Auditory Brainstem Implantation (ABI) in Patients without Neurofibromatosis Type 2*. Asia-Pacific Symposium on Cochlear Implants, Sydney, Australia. October 2007.
- Buchman CA. *Hearing Loss in Children: An Otolologist's Perspective*. Fourth Sound Foundations Through Early Amplification Conference, Chicago, IL. December 6, 2007.
- Buchman CA. *Pediatric Hearing Loss*. The CCCDP and NC AG Bell Annual Meeting, Asheboro, NC. November 9, 2007.
- Buchman CA, Roush PA. *Auditory Neuropathy/Auditory Dys-Synchrony*. Making the Connections, EHDI Bi-Annual Meeting. Greensboro, NC. October 5, 2007.
- Buchman CA. *Controversies in Cochlear Implantation*. Making the Connections, EHDI Bi-Annual Meeting, Greensboro, NC. October 5, 2007.
- Buchman CA and Tucci D. *Cochlear Implantation. Focus on Hearing*. Sponsored by the Division of Speech and Hearing Sciences, University of North Carolina at Chapel Hill, Friday Center, Chapel Hill, NC. September 14, 2007.
- Buchman CA. *Ménière's Disease and Other Medically Related Conditions*. Sponsored by the Division of Speech and Hearing Sciences, University of North Carolina at Chapel Hill, Friday Center, Chapel Hill, NC. September 14, 2007.
- Buchman CA. *Pediatric Tympanoplasty*. Visiting Professor. Department of Otolaryngology, University of Texas Southwestern, Dallas, TX. July 5-6, 2007.
- Buchman CA. *Auditory Neuropathy in Children*. Visiting Professor. Department of Otolaryngology, University of Texas Southwestern, Dallas, TX. July 5-6, 2007.
- Buckmire R. *Care of the Professional Voice*. Panel discussion, Resident Research Day, Nashville TN. June 13, 2008.
- Buckmire, R. *2008 Update in Laryngology*. Newton Fischer Society Meeting, Chapel Hill, NC. June 7, 2008.
- Buckmire R, Markus E. *Taking Care of Your Voice*. Elon University Drama and Music Departments, Burlington, NC. February 5, 2008.
- Buckmire R, Markus E. *Taking Care of Your Voice*. Advanced High School Chorus Conductors, Winston Salem, NC. February 2, 2008.
- Buckmire R, Markus E. *Taking Care of Your Voice*. Women's Voices (chorus), Chapel Hill, NC. November 26, 2007.
- Buckmire R, Markus E. *Taking Care of Your Voice*. Chapel Hill Community Chorus. Chapel Hill, NC. November 6, 2007.

Buckmire R, Markus E. *Taking Care of Your Voice*. University of Chapel Hill Theatre Department, Chapel Hill, NC. October 25, 2007.

Buckmire R, Markus E. *Taking Care of Your Voice*. Raleigh Youth Choral Conductors, Raleigh, NC. October 2, 2007.

Couch ME. Moderator, Basic Science 7th International Conference on Head and Neck Cancer, San Francisco, CA. July 21, 2008.

Couch ME. *Current Treatments for Oral Cancer and the Oral Cancer Vaccine*. Carolina Institute for Oral Pathology, University of North Carolina, Chapel Hill, NC. July 16, 2008.

Couch ME. *Management of the NO Neck in Well-Differentiated Thyroid Cancer*. Joint Anglo-American Meeting, Dublin, Ireland. July 7, 2008.

Couch ME. *Role of NF- κ B Pathway in the Pathology of Inflammatory Diseases*. Colgene Inflammation Symposium, San Diego, CA. June 13, 2008.

Couch ME. *Novel NF- κ B Inhibitors in Cancer Cachexia*. Keystone Conference, Banff, Alberta, Canada. February 12-17, 2008.

Couch ME. *Metabolomics of Cancer Cachexia*. 4th International Cachexia Conference, Tampa, FL. December 6-9, 2007.

Couch ME, Moderator. *Evaluating Our Relationships with Industry: What's Professional and What's Not?* The Society of University Otolaryngologists – Head & Neck Surgeons, Washington, DC. November 3, 2007.

Couch ME, Panel Member. *The New ACGME Charge: How Should We Evaluate Professionalism in Our Departments?* The Society of University Otolaryngologists – Head & Neck Surgeons, Washington, DC. November 3, 2007.

Couch ME. *Preclinical Studies: Tumor Vaccine for Head & Neck Cancer*. North Carolina/South Carolina Assembly, Myrtle Beach, SC. July 21, 2007.

Curry JM, Bloedon EA, Malloy KM, Cognetti DM, Merton DA, Goldberg BB, Rosen D, Pribitkin EA. *Contrast-Enhanced Ultrasound Guided Sentinel Lymph Node Biopsy of the Head and Neck in a Porcine Model*. American Academy of Otolaryngology-Head and Neck Surgery Annual Meeting, Washington, DC. September 16-19, 2007.

Demke JC, Rose AS. *Cleft Care in the West Bank*. Newton D. Fischer Society Meeting, Chapel Hill, NC. June 7, 2008.

Drake AF, Abode JK, Reilly CA, Stein JN, Malinzak EB, Harris WT, Zdanski CJ. *Experience of the School-Aged Child with Tracheostomy*. Poster presentation, Combined Otolaryngology Spring Meeting, Orlando, FL. May 1, 2008.

Eapen RJ, Buss E, Adunka MC, Pillsbury HC, Buchman CA. *Hearing-in-Noise Benefits Following Bilateral Simultaneous Cochlear Implantation Continue to Improve Four Years after Implantation*. Poster presentation, 10th International Conference on Cochlear Implants and Other Implantable Auditory Technologies, San Diego, CA. April 10-12, 2008.

Eapen R, Buss E, Adunka MC, Pillsbury HC, Buchman CA. *Continued Improvements in Hearing in Noise 4 years Following Bilateral Simultaneous Cochlear Implantation in Adults*. Annual Meeting of the American Neurotology Society, Orlando, FL. April 2008.

Eapen RJ, Buss E, Adunka MC, Pillsbury HC, Buchman CA. *Hearing-in-Noise Benefits Following Bilateral Simultaneous Cochlear Implantation Continues to Improve Four Years After Implantation*. Annual Meeting of the American Otological Society, Orlando, FL. May 2, 2008.

Eapen RJ, Buss E, Adunka MC, Pillsbury HC, Buchman CA. *Hearing-in-Noise Benefits Following Bilateral Simultaneous Cochlear Implantation Continue to Improve Four Years After Implantation*. Newton D. Fischer Society Meeting, Chapel Hill, NC. June 7, 2008.

Eskridge HR, Brown CJ, Henderson L, Teagle HFB, Buchman CA, Pillsbury HC, CDaCI Investigative Team. *Speech Production Development in Children with Cochlear Implants as Measured by the Paden/Brown*. 10th International Conference on Cochlear Implants and Other Implantable Auditory Technologies, San Diego, CA, April 10-12, 2008.

Finley CC, Holden L, Holden T, Whiting B, Skinner M. *Alternative Fitting Strategies Based on Peripheral Electrode Position* (Selected best oral presentation). Eighth Advanced Bionics European Investigators' Conference, Marrakech, Morocco. March 7-8, 2008.

Finley CC, Holden L, Holden T, Whiting B, Skinner M. *Possible Ectopic Stimulation in the Internal Acoustic Meatus Based on Electrophysiological Measures* (poster presentation). Eighth Advanced Bionics European Investigators' Conference, Marrakech, Morocco. March 7-8, 2008.

Finley CC, Holden L, Holden T, Whiting B, Skinner M. *Identification of and Interventions for Peripheral Factors Limiting Cochlear Implant Outcomes*. Eighth Bionics European Research Group Meeting, Marrakech, Morocco. March 6, 2008.

Finley CC, Holden L, Holden T, Whiting B, Skinner M. *Identification of and Interventions for Peripheral Factors Limiting Cochlear Implant Outcomes*. Advanced Bionics European Investigators' Conference, Paris, France. January 2008.

Finley CC, Holden L, Holden T, Whiting B, Skinner M. *Simple Fitting Modifications Based on Measures of Peripheral Variability in Individual Subjects* (poster presentation). Conference on Implantable Auditory Prostheses, Granlibbaken Conference Center, Lake Tahoe, CA. July 15-20, 2007.

Gore MR, Zanation AM. *Salvage Treatment and Treatment of Late Cervical Metastasis in Esthesioneuroblastoma*. 2008 International Head and Neck Cancer Meeting, American Head and Neck Society. San Francisco, CA. July 20, 2008.

Harmon PJ, Tang W, Gulley ML, Kazembe P, Martinson F, Wokocho C, Mwansambo C, Hoffman I, Hoffman M, Shores CG. *Viral Response to Chemotherapy in Endemic Burkitt Lymphoma-Preliminary Data*. Caribbean Association of Otolaryngology, Suriname. March 2008.

Harmon PJ, Tang W, Gulley ML, Kazembe P, Martinson F, Wokocho C, Mwansambo C, Hoffman I, Hoffman M, Shores CG. *Viral Response to Chemotherapy in Endemic Burkitt Lymphoma* (poster presentation). American Head and Neck Society Meeting, San Francisco, CA. July 2008.

- Harmon PJ. *Philanthropic Otolaryngology* (panel discussion, resident's perspective). National Medical Association, Atlanta, GA. July 2008.
- Kölln KA, Senior BA. *Complications of MIPS*. Annual Meeting of the American Rhinologic Society. Washington, DC. September 15, 2007.
- LaCour JB, Johnson M, Ewend MG, Buchman CA. *Interactions between Programmable Ventriculoperitoneal Shunt Valves and Cochlear Implant Magnets*. 10th International Conference on Cochlear Implants and Other Implantable Auditory Technologies, San Diego, CA. April 10-12, 2008.
- Ladner KM, Adunka OF, Adunka MC, Buss E, Pillsbury HC. *Speech Performance after Deep Implantation of the MED-EL Combi 40+ Medium Electrode*. Triological Southern Section Meeting, Naples, FL. January 11, 2008.
- Ladner KM, West AN, Senior BA. *Role of Eotaxin in Sinusitis*. Annual Meeting of the American Rhinologic Association. Washington, DC. September 15, 2007.
- Leight WD, Senior BA. *The Use of Intraoperative CT Scanning as an Educational Tool for Functional Endoscopic Sinus Surgery*. Southern Section Meeting of the Triological Society, Naples, FL. January 11-12, 2008.
- Manis PB. *Listening Quickly: The Roles of Voltage Gated Conductances in Auditory Information Processing*. University of Michigan, Department of Neuroscience, Ann Arbor, MI. October 8, 2007.
- Manis PB. *Synaptic Circuits of the Cochlear Nucleus and Thoughts on the Physiological Consequences of Hearing Loss*. University of Michigan, Krege Hearing Research Institute, Ann Arbor, MI. October 10, 2007.
- Manis PB. *Listening Quickly: The Roles of Voltage Gated Conductances in Auditory Information Processing*. Rutgers University, Department of Biology, Rutgers, NJ. October 26, 2007.
- Olshan AF. *Environment, Epidemiology, and Childhood Cancer: At a Crossroads?* National Institute of Environmental Health Sciences, July 16, 2007.
- Olshan AF. *Formaldehyde Studies*. Current Topics in Occupational and Environmental Cancer. National Cancer Institute. November 28, 2007.
- Olshan AF. *Rapid Case Ascertainment*. Cancer Control and Population Science Directors and Program Leaders Meeting. Sixth Annual AACR International Conference Frontiers in Cancer Prevention, December 6, 2007.
- Patel MR, Shockley WW. *Oral and Plunging Ranulas: Myths and Misconceptions*. 2008 North Carolina-South Carolina Otolaryngology-Head and Neck Surgery Assembly. Pinehurst, NC. July 18, 2008.
- Pillsbury HC. *Hearing Implants in Sensorineural Hearing Loss*, Collegium Oto-Rhino-Laryngologicum Amicitiae Sacrum, Berlin, Germany. August 26, 2008.
- Pillsbury HC. *Allergic Rhinitis vs. Vasomotor Rhinitis- What's New?* North Carolina Academy of Physician Assistants, Myrtle Beach, SC. August 21, 2008.

- Pillsbury HC. *Workforce Issues in Otolaryngology-Head and Neck Surgery*. Newton D. Fischer Society Meeting, Chapel Hill, NC. June 7, 2008.
- Pillsbury HC. *Complications of Cochlear Implants – What To Do*. Grand Rounds, Division of Otolaryngology-Head and Neck Surgery, University of California-San Diego, San Diego, CA. April 11, 2008.
- Pillsbury HC. *Physician Workforce Issues*. San Diego Academy of Otolaryngology, San Diego, CA. April 9, 2008.
- Pillsbury HC. *Workforce Issues in Otolaryngology*. Temporal Bone Dissection and Otology Update. Masters of Otolaryngology Symposium, Medical College of Georgia, Augusta, GA. March 29, 2008.
- Pillsbury HC. *Update on Cochlear Implants*. Temporal Bone Dissection and Otology Update. Masters of Otolaryngology Symposium, Medical College of Georgia, Augusta, GA. March 28, 2008.
- Pillsbury HC. *Reactive Airway Disease: The Otolaryngologist's Perspective*. 2008 Pinehurst Medical Symposium. FirstHealth Moore Regional Hospital, Pinehurst, NC. March 1, 2008.
- Pillsbury HC. *Advances in Cochlear Implant Surgery*. Seratoma Club, Hillsborough, NC. January 15, 2008.
- Pillsbury HC. *The OHNS Workforce: Where We Have Been and Where We Are Going*. NC State Coders Conference, Cary, NC. September 28, 2007.
- Pillsbury HC, Moderator. Krouse J, Ferguson BJ, Lanza D, Hadley J, Panelists. *Allergy Therapy*. Annual Meeting of the American Academy of Otolaryngic Allergy, Washington, DC. September 17, 2007.
- Pillsbury HC, Chiu A, Haydon R, Panelists. Fornadley J, Moderator. *Optimal Evaluation to Customize Therapeutic Intervention*. Annual Meeting of the American Academy of Otolaryngic Allergy, Washington, DC. September 17, 2007.
- Pillsbury HC. *Cochlear Implantation in Patients with Residual Hearing*, Collegium Oto-Rhino-Laryngologicum Amicitiae Sacrum, Seoul, South Korea. August 29, 2007.
- Pillsbury HC. *ORL Workforce Issues in the U.S*. The Cartesian Society Meeting, St. Michaels, MD. July 21, 2007.
- Rogers GA, Wise SK, Senior BA, DelGaudio JM. *Intraoperative Computed Tomography: A Valuable Learning Tool for Sinus Surgery*. Southern Section Meeting of the Triological Society, Naples, FL, January 11-12, 2008.
- Rose AS. *Otolaryngology Issues in Cleft Care*. 2nd Meeting of the Palestinian Cleft Society, Ramallah, West Bank. May, 2008.
- Rose AS. *Review of Pediatric Airway Surgery*. Otolaryngology-Head & Neck Surgery Grand Rounds, National Pediatric Hospital. Hanoi, Vietnam. August 27, 2007.
- Rose AS. *Diagnosis and Treatment of Acute Mastoiditis*. Otolaryngology-Head & Neck Surgery Grand Rounds, National Pediatric Hospital. Hanoi, Vietnam. August 28, 2007.

Rose AS. *Foreign Bodies of the Airway and Esophagus*. Grand Rounds, Hospital E. Hanoi, Vietnam. August 29, 2007.

Roush PA. *Management of Auditory Neuropathy/Auditory Dys-synchrony: Hearing Aids*. Invited paper for the Guidelines Development Conference on Auditory Neuropathy/Auditory Dys-synchrony at the International Newborn Hearing Screening Conference, Cernobbia, Italy. June 2008.

Roush PA. *Auditory Neuropathy: A Clinician's Perspective*. Invited presentation for Guidelines Development Conference on Auditory Neuropathy held in conjunction with International Newborn Hearing Screening Conference, Cernobbio Italy. June 19-21, 2008.

Roush PA. *Auditory Neuropathy: A Clinician's Perspective*. 4th Annual Cochlear Implant Symposia on Auditory Neuropathy/Dys-synchrony and Cochlear Implantation. Nemours Children's Hospital, Delaware. April 29, 2008.

Roush PA. *Hearing Instrument Fitting in Infants: Practical Considerations and Challenges*. Invited presentation, Sound Foundations through Early Amplification Conference, Munich, Germany. April 18-19, 2008.

Roush PA. *Audiological Management of Infants and Children with Auditory Neuropathy/Dys-synchrony*. Invited presentation, Sound Foundations through Early Amplification Conference, Munich, Germany. April 18-19, 2008.

Roush PA. *Pediatric Grand Rounds*, Invited presentation. American Academy of Audiology Annual Convention, Charlotte, NC. April 3-6, 2008.

Roush PA, Buchman CA. *Auditory Neuropathy/Dys-synchrony: No Simple Solutions*. Invited presentation, American Academy of Audiology Annual Convention, Charlotte, NC, April 3-6, 2008.

Roush PA, Roush J, Grose J, Buchman CA, Teagle HFB, Page T. *Assessment and Management of the Hearing Impaired Child*. Annual Meeting of the American Academy of Audiology (Audiology NOW), Charlotte, NC. April 5, 2008.

Roush PA, Buchman CA, Grose JH, Teagle H, Page T, Roush J. *Management of Infants and Children with Hearing Loss*. Invited presentation. Learning Lab presented at the American Academy of Audiology Annual Convention, Charlotte, NC, April 3, 2008.

Roush PA. *Behavioral Audiometry in Infants and Young Children*. Invited presentation. Early Identification, Diagnosis and Treatment of Deafness in Infants Conference, Madrid, Spain. February 21-22, 2008.

Roush PA. *Audiologic Management in Infancy: A Continuum of Care*. Invited presentation, A Sound Foundation through Early Amplification, 4th International Conference, Chicago, IL. December 6-8, 2007.

Roush PA, Buchman CA. *Auditory Neuropathy/Dys-synchrony: Diagnosis and Clinical Management*. Invited presentation, Making the Connections: A Conference about Childhood Hearing Loss, Greensboro, NC. October 5-6, 2007.

Roush PA. *Hearing and Audiology*. Invited presentation Auditory Verbal International, Raleigh, NC. August 23-24, 2007.

Roush PA. *Hearing Instrument Fitting in Infants: Practical Considerations and Challenges and Audiological Management of Infants and Young Children with Auditory Neuropathy/Dys-synchrony*. Invited presentations, First Latin American Pediatric Audiology Conference, Sao Paulo, Brazil. August 2-4, 2007.

Roush PA. *Management of Auditory Neuropathy/Auditory Dys-synchrony in Infants and Children*. Invited presentation, Phonak Pediatric Advisory Board, Zurich, Switzerland. July 1, 2007.

Senior BA. *Primary Surgery of the Frontal Sinus*. ERS/ISIAN, Heraklion, Greece. June 18, 2008.

Senior BA. *My Worst Case Ever*. ERS/ISIAN, Heraklion, Greece. June 19, 2008.

Senior BA. *Complications in Sinus Surgery*. New York Rhinology Meeting, New York, NY. May 16, 2008.

Senior BA. *Frontal Sinus Surgery*. New York Rhinology Meeting, New York, NY. May 16, 2008.

Senior BA. *Imaging*. New York Rhinology Meeting, New York, NY. May 16, 2008.

Senior BA. *Comprehensive Management of CSF Rhinorrhea*. New York Rhinology Meeting, New York, NY. May 16, 2008.

Senior BA. Moderator, *My Worst Case Ever*. Annual Meeting of the Triologic Society, Orlando, FL, May 1, 2008.

Senior BA. *Sinusitis: Where Does it Come From?* Southern States Rhinology Course, Kiawah Island, SC. April 10, 2008.

Senior BA. *Maximal Medical Therapy for Rhinosinusitis*. 4th Jakarta International FESS Course, University of Indonesia, Jakarta, Indonesia. March 6, 2008.

Senior BA. *Surgical Anatomy of the Lateral Nasal Wall and Paranasal Sinuses*. 4th Jakarta International FESS Course, University of Indonesia, Jakarta, Indonesia. March 6, 2008.

Senior BA. *Prevention and Treatment of Complications in Endoscopic Sinus Surgery*. 4th Jakarta International FESS Course, University of Indonesia, Jakarta, Indonesia. March 6, 2008.

Senior BA. *Navigation Systems and Their Application to Endoscopic Anterior Skull Base Surgery*. 4th Jakarta International FESS Course, University of Indonesia, Jakarta, Indonesia, March 6, 2008.

Senior BA. *Ethmoid and Maxillary Surgery*. Sinus Masters, Medical University of South Carolina, Charleston, SC. April 19, 2008.

Senior BA. *Image Guided Surgery for Neoplasms*. Sinus Masters, Medical University of South Carolina, Charleston, SC. April 19, 2008.

Senior BA. *Sinusitis: Where Does it Come From?* Charlotte Eye Ear Nose and Throat, Charlotte, NC. March 25, 2008.

Senior BA. *Sinusitis: Where Does it Come From?* Northeast Medical Center, Concord, NC. April 1, 2008.

Senior BA. *Review of ESS Landmarks and Advances.* Northeast Medical Center, Concord, NC. September 11, 2007.

Senior BA. *Etiology of Sinusitis.* Triangle ENT Society, Raleigh, NC. September 25, 2007.

Senior BA. *Pearls for Good Outcomes in Sinus Surgery.* Annual Meeting of Nassau Surgical Society. Long Island, NY. December 5, 2007.

Senior BA. *Frontal Sinus Surgery.* New Zealand Otolaryngology Conference. Queenstown, New Zealand. November 15, 2007.

Senior BA. *Minimally Invasive Pituitary Surgery.* New Zealand Otolaryngology Conference. Queenstown, New Zealand. November 14, 2007.

Senior BA. *Medical Management of Sinusitis.* New Zealand Otolaryngology Conference. Queenstown, New Zealand. November 14, 2007.

Senior BA. *Assessment of FESS Outcomes.* UCSF Otolaryngology Update. San Francisco, CA. November 8, 2007.

Senior BA. *Rhinogenic Headache: Real or Imagined?* UCSF Otolaryngology Update. San Francisco, CA. November 8, 2007.

Senior BA. *Secondary Frontal Sinus Surgery.* UCSF Otolaryngology Update. San Francisco, CA. November 8, 2007.

Senior BA. *Minimally Invasive Pituitary Surgery.* Otolaryngology Grand Rounds. Stanford University, Palo Alto, CA. November 8, 2007.

Senior BA. *New Technology in Sinus Surgery.* Annual Meeting of the American Academy of Otolaryngology-Head and Neck Surgery. Washington, DC. September 19, 2007.

Senior BA. *Endoscopic Skull Base Surgery: Sublime to Ridiculous.* Moderator. Annual Meeting of the American Academy of Otolaryngology-Head and Neck Surgery. Washington, DC. September 17, 2007.

Senior BA. *MIPS.* Annual Meeting of the American Academy of Otolaryngology-Head and Neck Surgery. Washington, DC. September 17, 2007.

Senior BA. *Surgical Anatomy of the Sinuses.* Annual Meeting of the American Academy of Otolaryngology-Head and Neck Surgery. Washington, DC. September 17, 2007.

Senior BA. *Approaches to the Pituitary.* Annual Meeting of the American Rhinologic Society. Washington, DC. September 15, 2007.

Senior BA. *Eotaxin: A Review.* Breakfast Symposium. Annual Meeting of the American Rhinologic Society. Washington, DC. September 15, 2007.

Senior BA. *State of the Art IGS.* ASEAN Otolaryngology Meeting, Ho Chi Minh City, Vietnam. August 22, 2007.

Senior BA. *Frontal Sinus Surgery*. ASEAN Otolaryngology Meeting, Ho Chi Minh City, Vietnam. August 23, 2007.

Senior BA. *Hydroscopy*. ASEAN Otolaryngology Meeting, Ho Chi Minh City, Vietnam. August 23, 2007.

Senior BA. *Frontal Anatomy & Surgery*. Pre-Congress FESS Course. Ho Chi Minh City, Vietnam. August 20, 2007.

Senior BA. *CSF Leak Repair*. Pre-Congress FESS Course. Ho Chi Minh City, Vietnam. August 20, 2007.

Senior BA. *Endoscopic Removal of Tumors*. Pre-Congress FESS Course. Ho Chi Minh City, Vietnam. August 20, 2007.

Senior BA. *Surgical Anatomy of the Sinuses*. Pre-Congress FESS Course. Ho Chi Minh City, Vietnam. August 20, 2007.

Senior BA. *Introduction to Minimally Invasive Pituitary Surgery*. Multidisciplinary Pituitary Tumor Board, University of North Carolina, Chapel Hill, NC, August 1, 2007.

Shockley WW. *My Approach to Functional Rhinoplasty*. Portland Rhinoplasty Course, Oregon Health and Science University, Portland, OR. July 26, 2008.

Shockley WW. *Osteotomies: Refinements and Pitfalls*. Portland Rhinoplasty Course, Oregon Health and Science University, Portland, OR. July 25, 2008.

Shockley WW. *Dorsal Augmentation: Materials and Techniques*. Portland Rhinoplasty Course, Oregon Health and Science University, Portland, OR. July 25, 2008.

Shockley WW. *Practical Tips in the Management of Facial Scars*. North Carolina-South Carolina Otolaryngology-Head and Neck Surgery Assembly, Pinehurst, NC. July 18, 2008.

Shockley WW, Cannon TY. *Management of Frontal Sinus Fractures*. Fitz-Hugh Symposium, University of Virginia, Charlottesville, VA. June 14, 2008.

Shockley WW, Eapen RP. *Midface and LeFort Fractures*. Fitz-Hugh Symposium, University of Virginia, Charlottesville, VA. June 14, 2008.

Shockley WW, Stadler ME. *Facial Soft Tissue Trauma*. Fitz-Hugh Symposium, University of Virginia, Charlottesville, VA. June 14, 2008.

Shockley WW. *Update on the First Face Transplant*. Fitz-Hugh Symposium, University of Virginia, Charlottesville, VA. June 14, 2008.

Shockley WW. *What Ever Happened to the Lady with the First Face Transplant?* Newton D. Fischer Society Meeting, University of North Carolina, Chapel Hill, NC. June 7, 2008.

Skinner M, Holden L, Holden T, Heydebrand G, Finley C, Strube M, Brenner C, Potts L, Gotter B, Vanderhoof S, Mispagel K. *Factors Predictive of Open-Set Word Recognition in Adults with Cochlear Implants* (poster presentation). Conference on Implantable Auditory Prostheses, Granlibbaken Conference Center, Lake Tahoe, CA. July 15-20, 2007.

Teagle HFB, Woodard J, Hatch D, Roush PA, Brown CJ, Zdanski CJ, Buchman CA. *Diversity of Outcomes in Cochlear Implantation for Children with Auditory Neuropathy*. 10th International Conference on Cochlear Implants and Other Implantable Auditory Technologies, San Diego, CA, April 10-12, 2008.

Teagle HFB. *Troubleshooting Your Child's Assistive Technology*. NC Spring Camp. Camp Cheerio, NC. May 18, 2008.

Weissler MC, Shores CG, Couch ME. Panel Discussion: *New Trends in the Treatment of Head and Neck Cancer*. Newton D. Fischer Society Meeting. Chapel Hill, NC. June 7, 2008.

Weissler MC, Zanation AM. *Image Guided CO2 Flexible Fiber Laser Resection of a Recurrent Nasopharyngeal Cancer*. Video presentation. American College of Surgeons Clinical Congress. New Orleans, LA. October 10, 2007.

West AN, Ladner KM, Senior BA. *Role of Eotaxin in Sinusitis*. Annual Meeting of the American Academy of Otolaryngologic Allergy. Washington, DC. September 16, 2007.

Zanation AM. *Clinical Outcomes of Endoscopic Endonasal Resections of Sinonasal Cancers*. 2008 International Head and Neck Cancer Meeting, American Head and Neck Society. San Francisco, CA. July 20, 2008.

Zanation AM. *Clinical Outcomes of Endoscopic Endonasal Resections of Esthesioneuroblastoma*. 2008 International Head and Neck Cancer Meeting, American Head and Neck Society. San Francisco, CA. July 20, 2008.

Zanation AM. *Endoscopic Endonasal Transpterygoid Nasopharyngectomy*. 2008 International Head and Neck Cancer Meeting, American Head and Neck Society. San Francisco, CA. July 23, 2008.

Zanation AM. *Advances in Endonasal Cranial Base Surgery*. Newton D. Fischer Society Meeting. University of North Carolina, Chapel Hill, NC. June 7, 2008.

Zanation AM. *Endoscopic Approaches to the Petrous Apex*. 2008 Third World Congress of Endoscopic Cranial Base Surgery, São Paulo, Brazil. May 2008.

Zanation AM. *Sinonasal Anatomy for Skull Base Surgery*. University of Pittsburgh Medical Center Endoscopic Skull Base Course. Pittsburgh, PA. June 1, 2008.

Zanation AM. *Endoscopic Resection of Giant JNAs*. Combined Otolaryngology Spring Meeting; American Society of Pediatric Otolaryngology Annual Meeting, Orlando, FL. April 2008.

Zanation AM. *Endoscopic Petrous Apex Surgery*. Combined Otolaryngology Spring Meeting; Triologic Society Annual Meeting. Orlando, FL, April 2008.

Zanation AM. *Seeing the Light: Endoscopic Endonasal Transorbital Tumor Surgery*. Combined Otolaryngology Spring Meeting; American Rhinologic Society Spring Meeting, Orlando, FL. April 2008.

Zanation AM. *Prospective Evaluation of 50 Nasoseptal Flaps for Endoscopic Skull Base Reconstruction*. Combined Otolaryngology Spring Meeting; American Rhinologic Society Spring Meeting, Orlando, FL. April 2008.

Zanation AM. *Endoscopic Craniofacial Resection and Reconstruction*. University of Pittsburgh Medical Center Otolaryngology/Head and Neck Surgery Alumni Day, Pittsburgh, PA. April 2008.

Zanation AM. *Sinonasal Anatomy for Skull Base Surgery*. University of Pittsburgh Medical Center Endoscopic Skull Base Course. Pittsburgh, PA. January 2008.

Zanation AM. *Seeing the Light: Endonasal Endoscopic Orbital Tumor Surgery*. Visiting Professor, Department of Otolaryngology/Head and Neck Surgery, University of North Carolina, Chapel Hill, NC. December 18, 2007.

Zanation AM. *Comprehensive Management of Esthesioneuroblastoma: Where Does Endoscopic Cranial Base Resection Fit In?* Visiting Professor, Grand Rounds, Department of Otolaryngology/Head and Neck Surgery, University of North Carolina, Chapel Hill, NC. December 19, 2007.

Zanation AM. *Endoscopic Management of Epistaxis and Endoscopic Pituitary Approaches*. University of Pittsburgh Medical Center Sinus and Endoscopic Surgery Course. Pittsburgh, PA. November 3, 2007.

Zanation AM. *Sinonasal Anatomy for Skull Base Surgery*. University of Pittsburgh Medical Center Endoscopic Skull Base Course. Pittsburgh, PA. September 23, 2007.

Zanation AM. *Petrous Apex Lesions and Endoscopic Approaches to the Petrous Apex*. Mini-Seminar: Endoscopic Skull Base Surgery. American Academy of Otolaryngology-Head and Neck Surgery Annual Meeting. Washington, DC. September 19, 2007.

Zdanski CJ, Teagle HFB, Roush PA, Hatch D, Buchman CA, Adunka OF, Brown CJ. *Assessment and Rehabilitation of Children with Auditory Neuropathy*. 10th International Conference on Cochlear Implants and Other Implantable Auditory Technologies, San Diego, CA. April 10-12, 2008.



Drs. Zanation and Shockley together on a clinic day at Carolina Pointe

PUBLICATIONS

- Adunka OF, Buchman CA. Scala tympani cochleostomy I: results of a survey. *Laryngoscope* 2007 Dec;117(12):2187-94.
- Adunka OF, Radeloff A, Gstoettner WK, Pillsbury HC, Buchman CA. Scala tympani cochleostomy II: topography and histology. *Laryngoscope* 2007 Dec;117(12):2195-200.
- Adunka OF, Jewells V, Buchman CA. Value of computed tomography in the evaluation of children with cochlear nerve deficiency. *Otol Neurotol* 2007 Aug;28(5):597-604.
- Adunka OF, Buchman CA. Cochlear implant fixation in children using periosteal sutures. *Otol Neurotol* 2007 Sep;28(6):768-70.
- Bassim MK, Patel KG, Buchman CA. Lateral semicircular canal dehiscence. *Otol Neurotol* 2007 Dec;28(8):1155-6.
- Bassim MK, Ewend MG, Buchman CA. Secondary intracanalicular extension of a primary intracochlear schwannoma. *Otol Neurotol* 2007 Sep;28(6):863-4.
- Bassim MK, Zdanski CJ. Electrode extrusion through the tympanic membrane in a pediatric patient. *Otolaryngol Head Neck Surg* 2007 Oct;137(4):680-1.
- Basura GJ, Abbas A, O'Donohue H, Lauder JM, Roth BL, Walker PD, Manis PB. Ontogeny of Serotonin and Serotonin (2A) Receptors in Rat Auditory Cortex. *Hear Res* 2008 Jul [Epub ahead of print].
- Blair CK, Roesler M, Xie Y, Gamis AS, Olshan AF, Heerema NA, Robison LL, Ross JA. Vitamin supplement use among children with Down syndrome and risk of leukemia: A Children's Oncology Group (COG) Study. *Paediatr Perinat Epidemiol* 2008;22:288-95.
- Blanks DA, Roberts JM, Buss E, Hall JW, Fitzpatrick DC. Neural and behavioral sensitivity to interaural time differences using amplitude modulated tones with mismatched carrier frequencies. *J Assoc Res Otolaryngol* 2007 Sep;8(3):393-408.
- Blanks DA, Buss E, Grose JH, Fitzpatrick DC, Hall JW. Interaural time discrimination of envelopes carried on high-frequency tones: An acoustic-hearing simulation of lateralization cues available to bilateral cochlear implant users. *Ear Hear* 2008;29(5):674-83.
- Blanks DA, Ebert CS Jr, Eapen RP, Zdanski CJ, Kandimalla ER, Agrawal S, Prazma J. Immune modulatory oligonucleotides in the prevention and treatment of OVA-induced Eustachian tube dysfunction in rats. *Otolaryngol Head Neck Surg* 2007 Aug;137(2):321-6.
- Bryson PC, Shores CG, Hart C, Thorne L, Patel MR, Richey L, Farag A, Zanation AM. Immunohistochemical distinction of follicular thyroid adenomas and follicular carcinomas. *Arch Otolaryngol Head Neck Surg* 2008 Jun;134(6):581-6.
- Bunin GR, Spector LG, Olshan AF, Robison LL, Roesler M, Grufferman S, Shu XO, Ross JA. Secular trends in response rates for controls selected by random-digit dialing in childhood cancer studies: A report from the Children's Oncology Group. *Am J Epidemiol* 2007;166:109-16.

Buss E, Pillsbury HC, Buchman CA, Pillsbury CH, Clark MS, Haynes DS, Labadie RF, Amberg S, Roland PS, Kruger P, Novak MA, Wirth JA, Black JM, Peters R, Lake J, Wackym PA, Firszt JB, Wilson BS, Lawson DT, Schatzer R, D'Haese PS, Barco AL. Multicenter U.S. bilateral MED-EL cochlear implantation study: speech perception over the first year of use. *Ear Hear* 2008 Jan;29(1):20-32.

Cohen SS, Palmieri RT, Nyante SJ, Koralek DO, Kim S, Bradshaw P, Olshan AF: A Review: Obesity and screening for breast, cervical and colorectal cancer in women. *Cancer* 2008;112(9):1892-904.

Cannon TY, Guttridge D, Dahlman J, George JR, Lai V, Shores C, Buzková P and Couch ME, The Effect of Altered Toll-like Receptor 4 Signaling on Cancer Cachexia. *Arch Otolaryngol Head Neck Surg* 2007;133:1263-9.

Cannon T, Couch M, Yin X, Guttridge D, Lai V, Shores C. Comparison of Animal Models for Head and Neck Cancer Cachexia. *Laryngoscope* 2007;117(12):2152-8.

Cannon T, Shores C, Yin X, Dahlman J, Guttridge D, Lai V, George J, Buzkova P, Couch M. Immunocompetent murine model of cancer cachexia for head and neck squamous cell carcinoma. *Head Neck* 2007;30(3):320-326.

Couch M, Lai V, Cannon T, Guttridge D, Zanation A, George J, Hayes DN, Zeisel S, Shores C. Cancer cachexia syndrome in head and neck cancer patients Part I. Diagnosis, impact on quality of life and survival and treatment. *Head Neck* 2007;29:401-11.

Couch ME, Ferris RL, Brennan JA, Koch WM, Jaffee EM, Leibowitz MS, Nepom GT, Erlich HA, Sidransky D. Alteration of cellular and humoral immunity by mutant p53 protein and processed mutant peptide in head and neck cancer. *Clin Cancer Res* 2007 Dec 1;13(23):7199-206.

Cullen RD, Fayad JN, Luxford WM, Buchman CA. Revision cochlear implant surgery in children. *Otol Neurotol* 2008 Feb;29(2):214-20.

Curry JM, Bloedon EA, Malloy KM, Cognetti DM, Merton DA, Goldberg BB, Rosen D, Pribitkin EA. Contrast-Enhanced Ultrasound Guided Sentinel Lymph Node Biopsy of the Head and Neck in a Porcine Model. *Otolaryngol Head Neck Surg* 2007 Nov;137(5):735-41.

Das S, Maeso PA, Figueroa RE, Senior BA, Delgaudio JM, Sillers MJ, Schlosser RJ, Kountakis SE. The use of portable intraoperative computed tomography scanning for real-time image guidance: a pilot cadaver study. *Am J Rhinol* 2008 Mar-Apr;22(2):166-9.

Demke JC, Bassim MK, Patel MR, Dean S, Rahbar R, van Aalst JA, Drake AF. Parental perceptions and morbidity: Tracheostomy and Pierre Robin sequence. *Int J Pediatr Otorhinolaryngol* 2008 Oct;72(10):1509-16.

Dubin MG, Liu C, Lin SY, Senior BA. American Rhinologic Society member survey on "maximal medical therapy" for chronic rhinosinusitis. *Am J Rhinol* 2007 Jul-Aug;21(4):483-8.

Eapen RJ, Ebert CS Jr, Pillsbury HC 3rd. Allergic rhinitis--history and presentation. *Otolaryngol Clin North Am.* 2008 Apr;41(2):325-30, vi-vii.

- Eapen RJ, Buss E, Grose JH, Drake AF, Dev MB, Hall JW. The development of frequency weighting for speech in children with a history of otitis media with effusion. *Ear Hear* 2008;29(5):718-24.
- Ebert CS Jr, Blanks DA, Patel MR, Coffey CS, Marshall AF, Fitzpatrick DC. Behavioral sensitivity to interaural time differences in the rabbit. *Hear Res* 2008 Jan;235(1-2):134-42.
- Felini M, Olshan A, Schroeder J, North K, Carozza, Kelsey K, Rice T, Wrensch M. DNA repair polymorphisms XRCC1 and MGMT and risk of adult gliomas. *Neuroepidemiology* 2007;29:55-58.
- Francis HW, Buchman CA, Visaya JM, Wang NY, Zwolan TA, Fink NE, Niparko JK; CDaCI Investigative Team. Surgical factors in pediatric cochlear implantation and their early effects on electrode activation and functional outcomes. *Otol Neurotol* 2008 Jun;29(4):502-8.
- George A. Spirou, Florin V. Chirila, Henrique von Gersdorff and Paul B. Manis, Heterogeneous Ca²⁺ influx along the adult calyx of Held: a structural and computational study. *Neuroscience* 2008;154:171-185.
- George J, Cannon T, Lai V, Richey L, Zanation A, Hayes DN, Shores C, Guttridge D and Couch M. Cancer cachexia syndrome in head and neck cancer patients Part II. Pathophysiology. *Head Neck* 2007;29:497-507.
- Gore MR, Rose AS. Formation of an airway foreign body during removal of a metal tracheostomy tube: a case report. *Ear Nose Throat J* 2008 Mar;87(3):169-71.
- Grose JH, Buss E, Hall JW III. Gap detection in modulated noise: Across-frequency facilitation and interference. *J Acous Soc Am* 2007;123:998-1007.
- Gstoettner WK, Van De Heyning P, O'Connor AF, Morera C, Sainz M, Vermeire K, McDonald S, Cavalle L, Helbig S, Valdecasas JG, Anderson I, Adunka OF. Electric acoustic stimulation of the auditory system: results of a multi-centre investigation. *Acta Otolaryngol* 2008 Mar;12:1-8.
- Hall JW III, Buss E, Grose JH. The effect of hearing impairment on the identification of speech that is modulated synchronously or asynchronously across frequency. *J Acous Soc Am* 2007;123:955-962.
- Hall JW III, Buss E, Grose JH. Comodulation detection differences in children and adults. *J Acous Soc Am* 2008;123:2213-19.
- Harrill WC, Pillsbury HC 3rd, McGuirt WF, Stewart MG. Radiofrequency turbinate reduction: a NOSE evaluation. *Laryngoscope* 2007 Nov;117(11):1912-9.
- Hashibe M, Brennan P, Benhamou S, Castellsague X, Chen C, Curado MP, Maso LD, Daudt AW, Fabianova E, Wünsch-Filho V, Franceschi S, Hayes R, Herrero R, Koifman S, La Vecchia C, Lazarus P, Levi F, Mates D, Matos E, Menezes A, Muscat J, Eluf-Neto J, Olshan A, Rudnai P, Schwartz SM, Smith E, Sturgis EM, Szeszenia-Dabrowska N, Talamini R, Wei Q, Winn DM, Zaridze D, Zatonski W, Zhang ZF, Berthiller J, Boffetta P. Alcohol drinking in never-tobacco users and cigarette smoking in never drinkers: pooled analysis in the International Head and Neck Cancer Epidemiology (INHANCE) consortium. *J Natl Cancer Inst* 2007;99:777-89.

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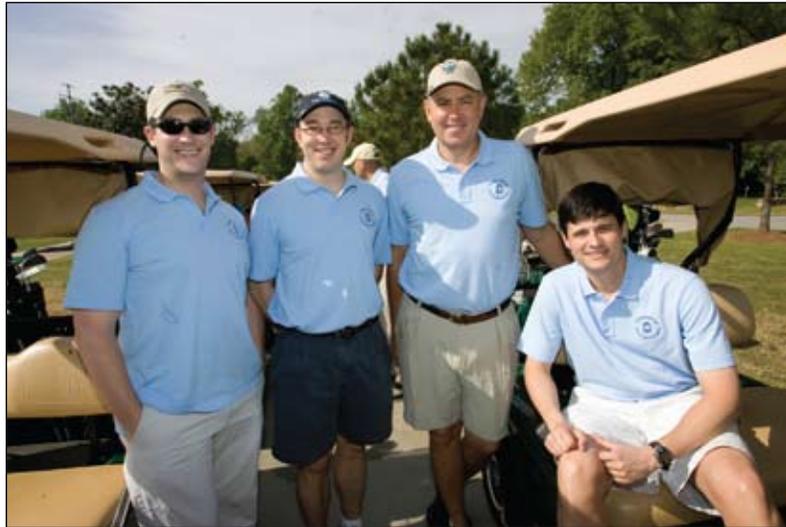
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GOLFING FOR A CAUSE

Several golfers representing the Department of Otolaryngology/Head and Neck Surgery played in the 5th Annual Charity Golf Classic sponsored by the UNC School of Medicine to benefit the Cystic Fibrosis Foundation. The tournament was held on April 19, 2008, at Finley Golf Course. Dr. Joshua Surowitz was in charge of organizing the three teams representing the department. He also won the putting contest, for which the prize was a brand new Taylor Made driver. (Photos by Brian Strickland Photographer)



Left to right: Josh Surowitz, Carlos Ebert, Eddie Couch (husband of Marion Couch), and Allen Marshall



Left to right: Matt Pearson (resident in Urology), Craig Buchman, Karen Bednarski, and her husband Brian Bednarski.



The end of a successful round! Left to right: George Leight (Derek's father), Rick Pillsbury, Derek Leight, and Gaelyn Garrett (ENT resident, 1994)



GIVING TO THE DEPARTMENT

Give hope to patients and their families
facing serious ear, nose, and throat diseases
with your gift to the UNC Department
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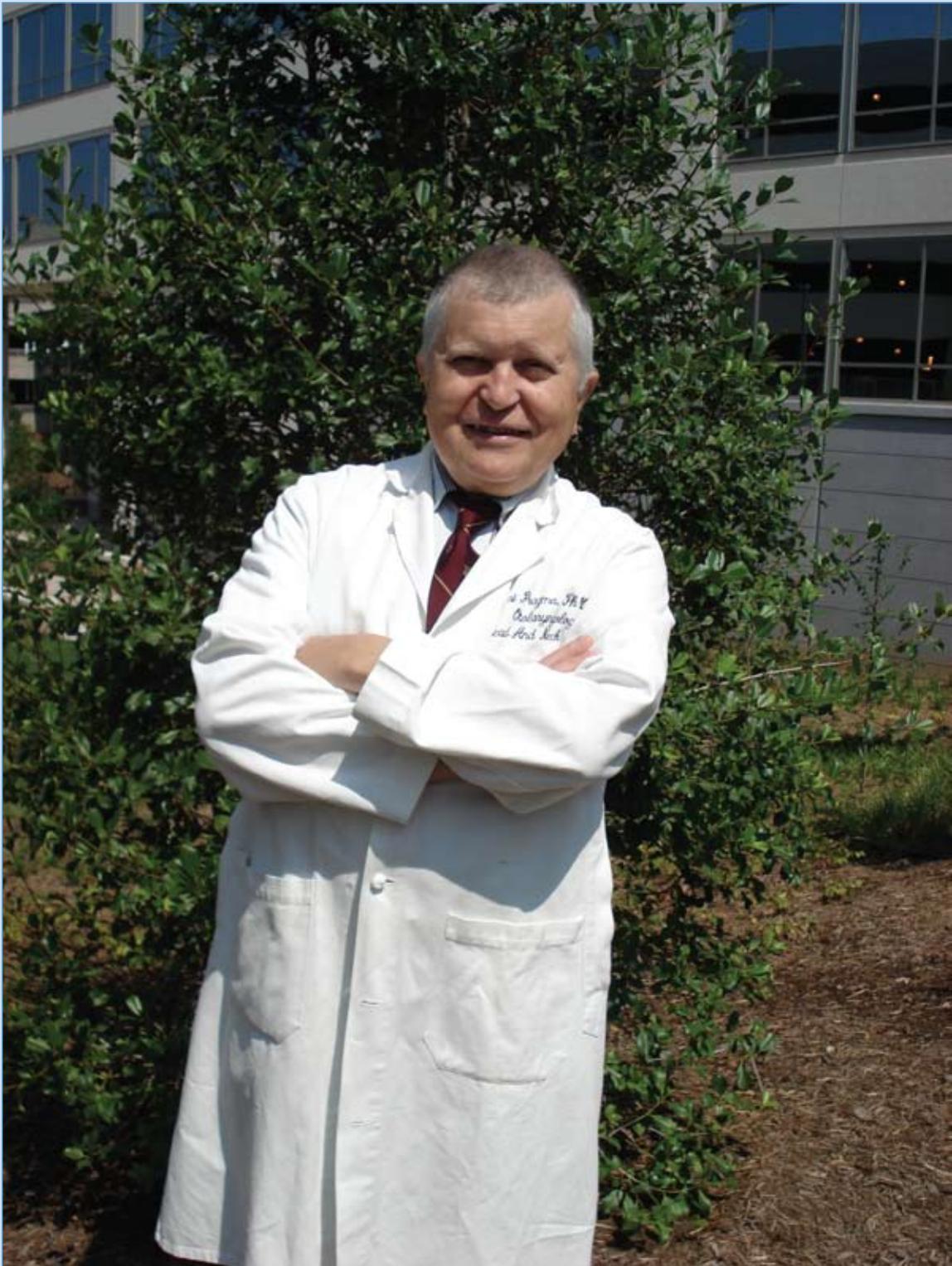


If you or someone you love has fought serious ear, nose, or throat diseases, you know how important hope can be. UNC wants to give you and your loved ones that hope, and you can help.

Your gift, whether or not it is in memory or honor of someone, can help the Department continue its national excellence in patient care, OHNS disease research, and patient education. We're seeing breakthroughs in a wide range of ear, nose, and throat diseases. We've also taken the lead in innovative and compassionate patient care. And we're training the best future OHNS physicians so that they can help your children and grandchildren.

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Dr. Jiri Prazma: The Father of ENT Research at UNC

Since 1969, he has been making outstanding contributions to the field of Otolaryngology and helping medical students and residents acquire the research skills they need to launch their careers.



Residents who graduated from our program in 2008: Steve C. Lee, MD, PhD; Karen A. Bednarski, MD; Joshua C. Demke, MD; and Jeffrey B. LaCour, MD.

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