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- Head & Neck Surgery

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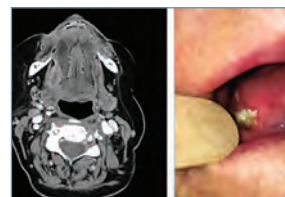


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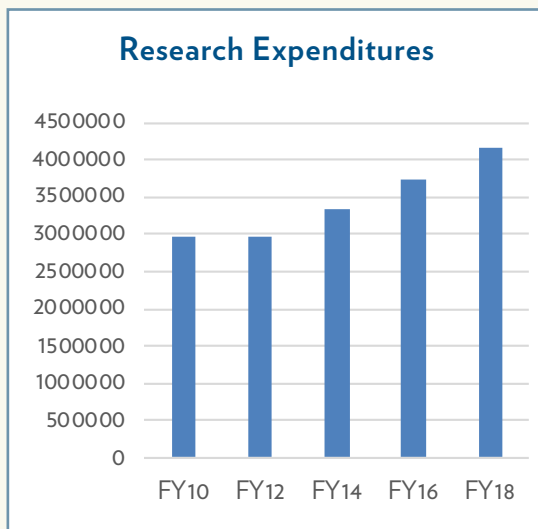
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Chairman's Corner

Of the tripartite mission, clinical care is usually the one which garners most of the attention. This is understandable since it is the RVU generator underpinning Academic Health Systems, and it is the focus of most otolaryngologists in academic or private practice. Given those facts, this edition of the SCOPE will review the status of a clinical program which opened in 2015: the Vestibular/Balance Center. Importantly, we also highlight aspects of our research and educational missions.

Research initiatives by two of our younger head and neck surgery academic investigators are discussed on pages 13 to 19, and include: 1. Strategies to optimize timing of sequential treatment modalities, especially post-operative radiation therapy, in patients with head and neck cancer, and 2. Novel neoadjuvant therapy and predictive biomarkers in oral cavity cancer.



The Department's research portfolio is well-balanced with RO1s in hearing, cancer, and immunology. This chart shows our continued upward trajectory in research funding with expenditures at \$4.1M, a 17 percent increase from just six years ago. We are pleased to be ranked approximately number 10 for the last 15 years in NIH dollars to departments of otolaryngology.

Aspects of our educational efforts are presented on pages 6 and 7. We are particularly pleased to announce that our Neurotology Fellowship was recently granted ACGME approval. This year we also initiated a fellowship in Facial Plastic and Reconstructive Surgery. In total, we train six fellows annually: two in Head and Neck Oncologic

and Microvascular Reconstructive Surgery; one in Rhinology, Sinus and Anterior Skull Base Surgery; one in Complex Pediatric ENT; one in Neurotology; and one in Facial Plastic and Reconstructive Surgery. One metric of success of our educational program is the competitiveness of our graduates (residents and fellows) for academic positions which span the continent (see figure on page 7). We take great pride in each of these individuals and know they serve patients with compassion, professionalism, and skill.

Sincerely,

Paul R. Lambert, M.D.

Paul R. Lambert, M.D.

Professor and Chair

Department of Otolaryngology - Head & Neck Surgery

Continuing Education



The 32nd Annual F. Johnson Putney Lectureship in Head & Neck Cancer

This half-day lectureship was held on December 8, 2017 under the direction of **Terry A. Day, M.D.** The keynote speaker was **Jonathan M. Irish, M.D., MSc, FRCSC, FACS**, Professor, Otolaryngology - Head & Neck Surgery, Provincial Head, Surgical Oncology Program, Cancer Care Ontario, The Kevin and Sandra Sullivan Chair in Surgical Oncology, University of Toronto. Participants heard world class Head and Neck specialists discuss improving the quality of health care for patients with head and neck cancer and a forward-looking vision of surgery in 2020.



The Temporal Bone Dissection Course

The seventeenth Temporal Bone Dissection Course was held on January 26-27, 2018 on the MUSC campus, directed by **Ted A. Meyer, M.D, Ph.D.** This course, designed for practicing otolaryngologists, focused on procedures for chronic ear disease and included hands-on training in our temporal bone dissection lab. Distinguished guest speaker was **Nikolas H. Blevins, M.D.**, Larry and Sharon Malcolmson Professor, Chief, Division of Otology/Neurotology, Medical Director, Stanford Cochlear Implant Center Department of Otolaryngology - Head and Neck Surgery Stanford University School of Medicine. The course was well attended by practitioners traveling from seven states.



The Charleston Pediatric ENT Update

The fifth annual Charleston Pediatric ENT Update, directed by **David R. White, M.D.**, was held February 10, 2018 at the Courtyard Marriott Historic District. This comprehensive full-day course for pediatricians, family practitioners, and otolaryngologists provided up-to-date guidelines to implement into daily practice, promote quality and efficient care, and tackle challenging ENT diagnoses with confidence. The keynote speaker was **Lee P. Smith, M.D.**, Chief, Division of Pediatric Otolaryngology, Steven and Alexandra Cohen Children's Medical Center of New York. Participants came from 12 states to attend, traveling from as far as Minnesota.



The Carolina's Pediatric Airway Course

This two day resident training course was co-directed by **David R. White, M.D.** and **Carlton J. Zdanski, M.D.**, UNC School of Medicine, February 8-9, 2019. It included lectures and hands-on labs focused on pediatric endoscopic and open airway surgical techniques. Residents and faculty participated from six colleges: MUSC, Children's Hospital of Georgia, Cohen Children's Medical Center of New York, Duke, Emory, Johns Hopkins, UNC, and Wake Forest.

The ABCs of Maxillofacial Prosthodontics Medical & Dental Billing

This one day course was held March 2, 2018, directed by **Betsy K. Davis, D.M.D.** at the Courtyard Marriott Historic District. The course was designed for the dental team emphasizing dentists, prosthodontists, and maxillofacial prosthodontists to review medical and dental billing for medically necessary dental treatment including general dentistry, prosthodontics, and maxillofacial prosthodontics.



The 6th Pediatric Audiology Conference: Improving Spoken Language Outcomes for Children with Hearing Loss

The Pediatric Audiology Conference directed by **Meredith Holcomb, Au.D., CCC-A** was held March 23, 2018, at the Courtyard Marriott Mount Pleasant. It was designed for all providers involved in the care of hearing impaired children. Key topics provided up-to-date knowledge to enable attendees to employ best current practices when caring for this sector of children. Guest speakers were **Amy McConkey Robbins, MS, CCC-SLP, LSLS Cert. AVT**, Speech Language Pathologist Communication Consulting Services; and **Kathryn Wilson, MA, CCC-SLP, LSLS Cert. AVT**, Director of Coaching and Mentoring Hearing First. The conference was presented to a full house of professionals of various disciplines from four states this year.



Please see upcoming conference on page 24.



Department hearing scientist honored for world-class research

On April 11, SC Gov. Henry D. McMaster presented **Judy R. Dubno, Ph.D.**, the state's highest honor: the Governor's Award for Excellence in Science.

Dubno is considered one of the premier scientists in the country who studies hearing loss and aging. She is a professor in the MUSC Department of Otolaryngology–Head and Neck Surgery and serves as the director of the hearing research program.

Kathleen Brady, M.D., Ph.D., vice president for research, said, “Dr. Dubno is a brilliant scientist and one of the most productive and collaborative individuals I have ever had the pleasure of working with. She is always generous in providing service to the academic community at MUSC through her mentoring and committee work. She is truly deserving of this honor.”

This prestigious award is presented to a scientist whose contributions to scientific discovery merit special recognition and have affected the respective discipline on a national and international basis.

The quality of Dr. Dubno's work is demonstrated by the continuous funding she has received for more than 30 years. She's the principal investigator on a coveted National Institutes of Health Research Project Grant, which is the longest-funded grant in the United States related to age-related hearing loss.

Honors & Awards

Chris M. Discolo, M.D., MSCR

- Promoted to Associate Professor

Evan M. Graboyes, M.D.

- American Cancer Society Institutional Research Grant renewed
- Delaware ACCEL Mentored Research Development Grant awarded
- Opened an investigator initiated trial: Phase II pilot study of cognitive behavioral therapy for body image disturbance in surgically-treated head and neck cancer patients
- Director, South Carolina Cancer Alliance Head and Neck Cancer Workgroup

Ted R. McRackan, M.D.

- Selected as a Cochrane Scholar
- American Cochlear Implant Alliance 2018 Meeting Organizing Committee and Co-Chair

Shaun A. Nguyen, M.D., FAPCR

- 2017 Mentor Training Program – American College of Physicians
- AAOHNSF Committee Excellence Award Outcomes Research and Evidence Based Medicine Committee

Ashli K. O'Rourke, M.D.

- Promoted to Associate Professor



Paul R. Lambert, M.D. received the **American Otologic Society Award of Merit** at the 2018 Annual Spring Meeting in Maryland. This is the most prestigious award given by the AOS, presented to an individual who has excelled in academics, mentorship, publications, research and otology in general.

Dr. Lambert had previously served as Secretary-Treasurer (2007-2012) and President (2013) of this Society.

Pictured above is Dr. Lambert with AOS Past President Debara L. Tucci, M.D., M.S., M.B.A., (center) who presented the award, and Mrs. Debbie Lambert.

During her tenure at MUSC, she has brought more than \$70 million to the institution. In addition to providing critical insights into the subject of hearing loss in older adults, this funding also has allowed for the employment of more than 100 research students and technicians. Most of the students have launched successful research careers, having had the opportunity to work closely with Dr. Dubno.

Dubno's research program has been ranked near the top in the nation for NIH funding in Departments of Otolaryngology over the last decade. "Her experience and expertise have been invaluable in fostering the research careers of many faculty within our department. This has been a key component of our national ranking as #11 Best Otolaryngology Departments in the country by U.S. News & World Report," said Paul R. Lambert, M.D., professor and chairman of the Department of Otolaryngology-Head and Neck Surgery.

Widely acknowledged as an auditory scientist for her expertise in hearing loss and aging, Dubno has served as a leader in scientific societies and worked extensively in public policy related to hearing loss to improve access and affordability of hearing-loss treatments.

She was elected president of two major scientific societies, the Association for Research in Otolaryngology and the Acoustical Society of America, and is an elected member of two honorary scientific societies. She has served on two NIH scientific review panels, having chaired one, and was a member of the Advisory Council of the NIH, which is the committee that makes the final funding recommendations to the NIH.

Dubno has served on four consensus committees of the National Academies of Sciences, Engineering, and Medicine (NASEM), focusing on hearing and noise in the military, evaluating a government hearing-loss prevention research program and conducting an analysis of the long-term effects of blast exposure to service members in the Gulf War.

Most recently, Dubno served on the NASEM Committee on Accessible and Affordable Hearing Health Care for Adults, which reviewed the evidence related to the importance of hearing to individual and societal health, including such issues as social isolation, physical and mental health



(Left to right): Craig Crosson, Ph.D., Senior Associate Dean for Research MUSC College of Medicine, SC Gov. Henry McMaster, Judy R. Dubno, Ph.D., Bob Quinn, Executive Director, SC Research Authority

consequences and economic productivity.

The committee reviewed and assessed current federal regulations, the affordability of hearing technologies and services and access to hearing health care. One of its recommendations was for the U.S. Food and Drug Administration to create a new category of over-the-counter hearing aids to improve access, lower costs and encourage innovative technologies. This recommendation directly led to the introduction of a bill in Congress that was signed into law on Aug. 18 as the Over-the-Counter Hearing Aid Act of 2017.

Dr. Dubno was recruited from UCLA in 1991 to enhance the research program in hearing at MUSC. At that time, there was growing recognition nationally that hearing loss was a major disability for older citizens, a problem that has only worsened in the ensuing decades, as baby boomers continue to reach senior status.

Today, it is estimated that 15 percent of individuals 18 years of age or older have some trouble hearing. This number increases to 25 percent for individuals ages 65 to 74 and over 50 percent for those 75 and older, according a 2010 report published by the National Institute of Deafness and Other Communication Disorders. The consequences of hearing loss are significant, said Dubno. In addition to the obvious safety issues, studies demonstrate an increased incidence of isolation and depression and possibly an accelerated cognitive decline in patients with hearing impairment. □

Neurotology Fellowship Receives ACGME Accreditation

Ted A. Meyer, M.D., Ph.D.

We are proud to announce that our Neurotology Fellowship received accreditation through the ACGME in January 2018. Ted A. Meyer, M.D., Ph.D. is the director of the fellowship program. The Neurotology fellowship provides comprehensive experience in all areas of otology and neurotology.

In 2012, Ted A. Meyer, M.D., Ph.D. and Paul R. Lambert, M.D. established a one-year fellowship in Neurotology. Stephen M. Kieran, M.D., from Dublin, Ireland, was our first fellow. Dr. Kieran trained in Dublin, then traveled to the United States for two fellowships, the first at Boston Children's/Harvard in Pediatric Otolaryngology, then at MUSC for Otology and Neurotology. Dr. Kieran returned to Dublin where he sees patients in the Mater Private Hospital with a focus on both Pediatric Otolaryngology and Otology.

In 2013, we lengthened the fellowship to two years. Habib G. Rizk, M.D., from Beirut, Lebanon, was our second fellow. Habib trained in Beirut, Lebanon, then travelled to the United States for two fellowships, the first in Delaware in Otology, then at MUSC for Otology and Neurotology. Dr. Rizk joined the faculty at MUSC in 2015, where he further developed our Vestibular and Balance Program, and now serves as its Director.

In addition, in 2015, Theodore R. McRackan, M.D., joined the Department. Dr. McRackan attended medical school at MUSC, completed his residency in Otolaryngology at Vanderbilt University in Nashville, and then spent two years in Los Angeles at the House Ear Clinic for his fellowship in Neurotology. Dr. McRackan returned to MUSC to further develop our Multidisciplinary Skullbase Surgery Program, now serving as its Director. With the additional growth in these important areas, we applied for fellowship accreditation through the ACGME in 2017 and were approved in early 2018.

Our current Neurotology Fellow, **Jonathan L. Hatch, M.D.**, began his fellowship in 2015. He completed his undergraduate work at Utah Valley University, medical school at Creighton University, and his residency in Otolaryngology at the University of Nebraska. Dr. Hatch will return to the University of Nebraska this summer to further develop the Otology-Neurotology Division.



Jonathan L. Hatch, M.D. trains other otolaryngologists in our Temporal Bone Dissection lab.

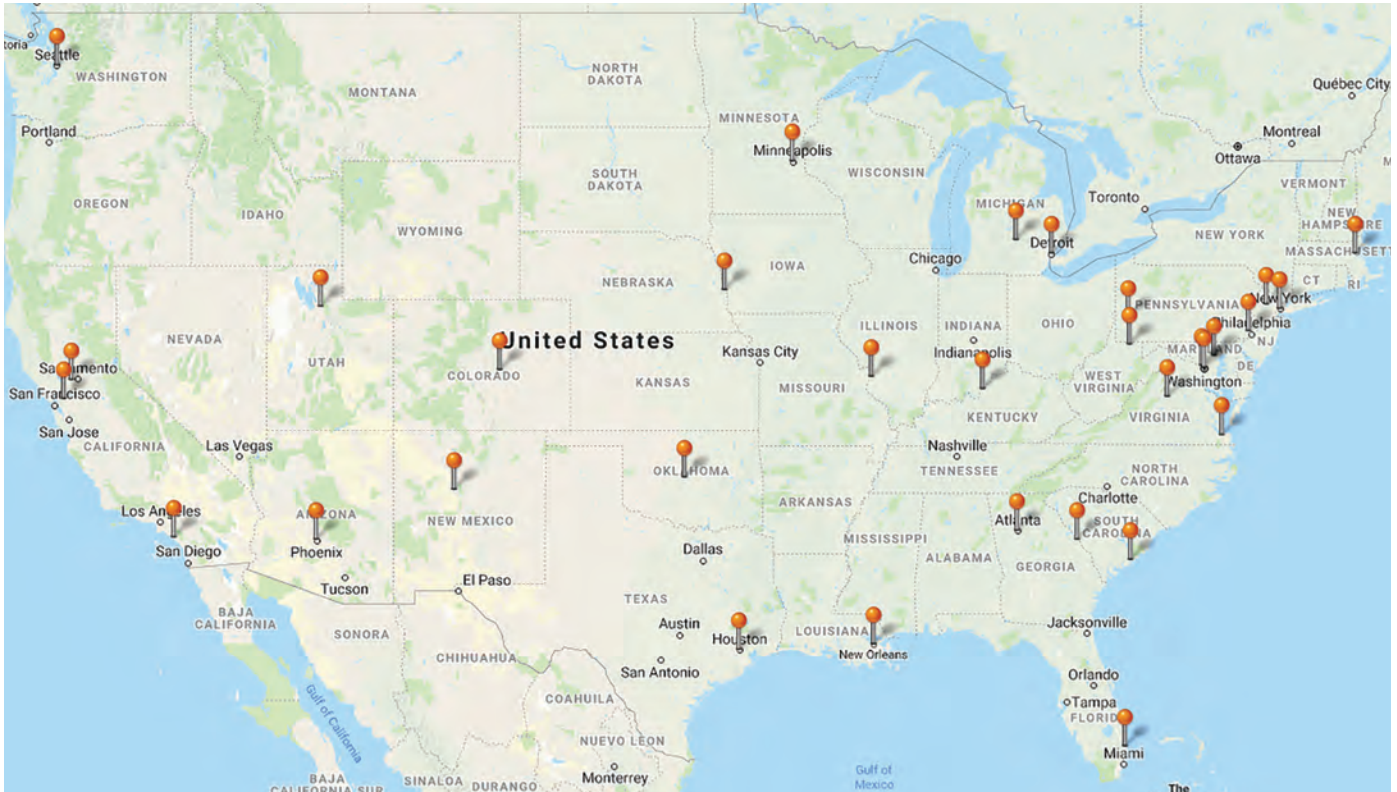
Dr. Hatch remarked, "MUSC has been a great place for fellowship. From the moment I started, I was engaged in an environment of professionalism, world-class clinical and surgical training, and opportunities for research. My training at MUSC has provided me with the confidence and skills needed to start my career as a Neurotologist at the University of Nebraska Medical Center."

Dr. Hatch is an outstanding clinician, teacher, researcher, and surgeon. During his tenure in Charleston, he has helped us train more than 25 Otolaryngology residents, he has already published 15 papers, and he will graduate with more than 25 scientific articles and chapters.

Yuan Liu, M.D. will join the MUSC Neurotology Fellowship program in July 2018. Dr.

Liu attended Harvard as an undergraduate majoring in Biochemical Sciences and Economics. He traveled west to UCLA for medical school, and remained in California for his Otolaryngology Residency at Loma Linda University. Dr. Liu has been an outstanding student and resident. Over





Where are they now? This map depicts locations of our graduating fellows (majority in academic centers). Locations outside of the U.S. include Canada, India, Ireland, Australia, South Australia, and Turkey.

the years, he received numerous scholarships and awards for his studies, research, and clinical work. Yuan brings an incredible passion for research to the Fellowship. As an Otolaryngology Resident, he has already published more than 20 papers.

We wish Dr. Hatch the best as he begins his career as an academic surgeon, and we look forward to working with Dr. Liu. □

We offer Fellowship training in:

- Facial Plastic and Reconstructive Surgery
- Head and Neck Oncologic Surgery / Microvascular Reconstruction
- Neurotology and Skull Base Surgery
- Pediatric ENT
- Rhinology and Sinus / Skull Base Surgery

Ted A. Meyer, M.D., Ph.D. joined the Department of Otolaryngology – Head and Neck Surgery at MUSC in 2004 and is the director of the MUSC Cochlear Implant Program. Dr. Meyer's practice involves the full range of otologic, neurotologic, and skull base diseases and disorders.

MUSC has performed more than 100 cochlear implants yearly since 2012. As director of the MUSC cochlear implant program, he oversees all clinical and research protocols involving patients with cochlear implants.



MUSC Dizziness and Vestibular Disorders Clinic

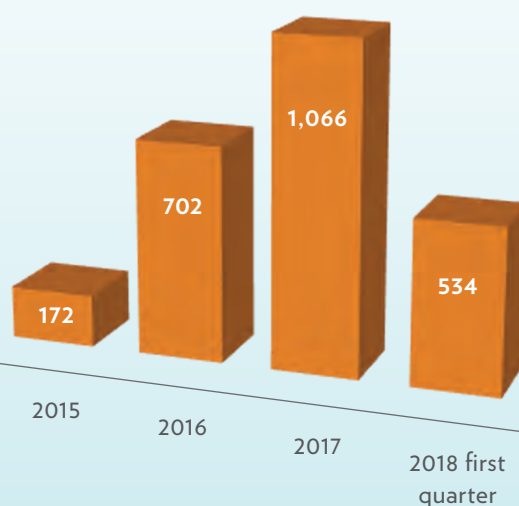
Habib G. Rizk, M.D.

The MUSC Dizziness and Vestibular Disorders Clinic was opened in August 2015. Included in our multidisciplinary team are vestibular audiologists, vestibular therapists, nutritionists as well as neurotologists. We also work in close collaboration with Neurology and Psychology for patients with central causes of dizziness and/or psychiatric comorbidities.

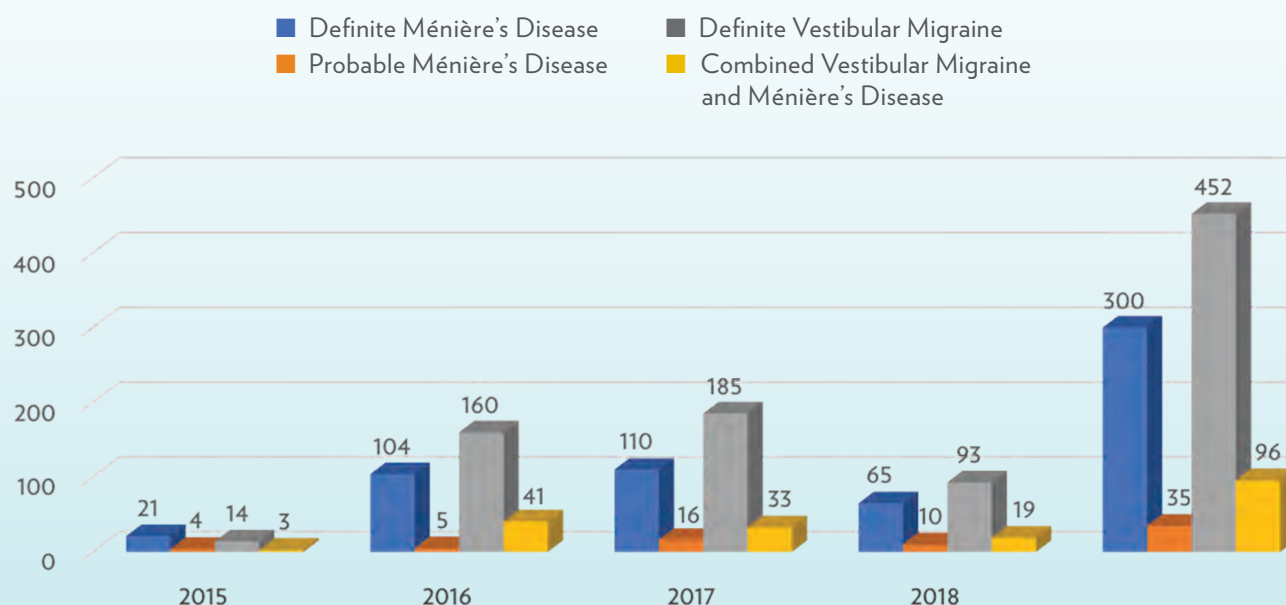
Since August 2015, we have evaluated over 2,000 patients with dizziness. Approximately 20 percent of those patients were diagnosed with definite Vestibular Migraine, 15 percent with definite Ménière's Disease and 20 percent with Benign Paroxysmal Positional Vertigo. Ten percent of patients presented with non-vestibular causes of dizziness and imbalance (i.e, hemodynamic disorders, neurologic abnormalities and medication side effects). Our patient volume has exponentially grown over the last three years.

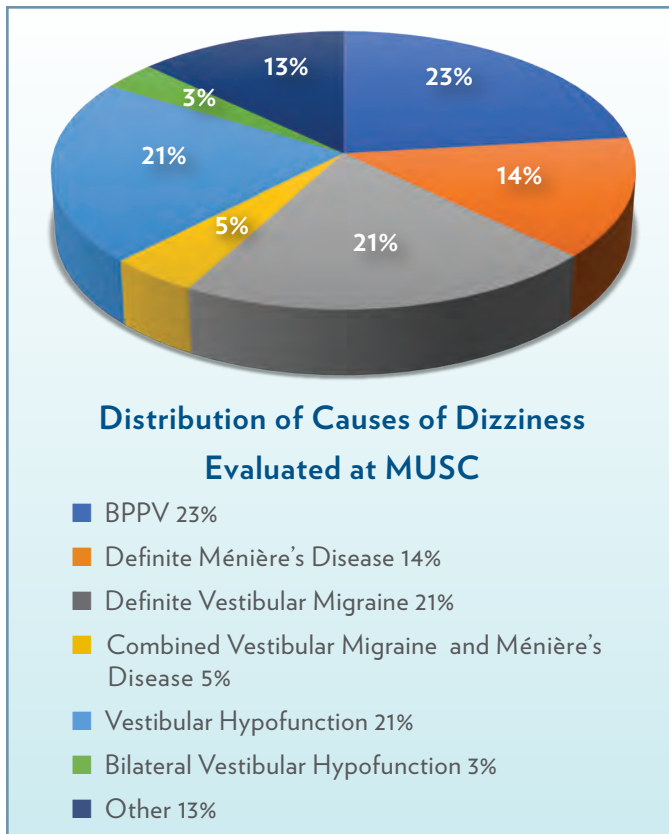
The following article describes our general approach to patients with symptoms suggesting Ménière's Disease and/or Vestibular Migraine.

Number of New Patient Evaluations in the MUSC Dizzy Clinic



Number of Patients with Ménière's Disease and Vestibular Migraine Evaluated at MUSC Since 2015





Management of Ménière's disease

The American Academy of Otolaryngology has published guidelines for the diagnosis and evaluation of therapy in Ménière's disease.¹ More recently, a Consensus document from various societies around the world, simplified these guidelines:²

- Definite MD is defined as two or more spontaneous episodes of vertigo, each lasting between 20 minutes and 12 hours, with a documented low to medium frequency SNHL in the affected ear on at least one occasion, before, during or after one of the episodes of vertigo; fluctuating aural symptoms (hearing loss, aural fullness, tinnitus) in the affected ear; and alternative diagnoses excluded.
- Probable MD is defined as two or more episodes of vertigo, each lasting between 20 minutes and 24 hours; fluctuating aural symptom; and other diagnoses ruled out.

Current treatment options are aimed at ameliorating symptoms (especially the vertigo) and stopping disease progression. Unfortunately, the literature is plagued with low-evidence articles, making a decisive algorithm difficult to build. However, listening to the patient's complaints, and identifying the degree of functional impairment, helps

guide clinical decision-making and optimize treatment. The latter can be divided into medical and surgical, and hearing-preserving intervention versus ablative procedures.

Counseling/Lifestyle modification:

<1500 mg sodium per day (<1200 mg if patient truly diligent)
Nutritionist consultation if needed
Promote good sleep hygiene
Psychotherapy if applicable



Diuretics

Triamterene-HCTZ or Acetazolamide*
Evidence indicates improvement in vertigo control but not hearing preservation
Sulfa allergy can theoretically cause cross-reactivity with HCTZ



Transtympanic steroids**

No consensus on dosing regimen
Our protocol: Dexamethasone 10 mg/cc: 3 injections of 0.4 cc over the course of 7 to 10 days



Transtympanic gentamicin***

Our protocol: gentamicin 40 mg/cc buffered with bicarbonate to a concentration of 28 to 30 mg/cc. Use once and reevaluate. Repeat if needed in one month



Surgery

*A recent systematic review identified only low-evidence studies.³

**A recent Cochrane review showed efficacy of transtympanic steroids in controlling vertigo episodes.⁴

***Transtympanic gentamicin treatment is the most widely used ablative option. It can help control the vertigo episodes by reducing vestibular function substantially, allowing for the compensation process to occur. Current trends in dosing regimen have shifted toward functional titration, with administration on demand. This provides good control of the vertigo frequency and has a lower risk of hearing loss.

What about Betahistine?

In Europe, Betahistine is the most widely prescribed maintenance therapy for Ménière's disease. It works centrally on the vestibular nuclei and may enhance compensation.

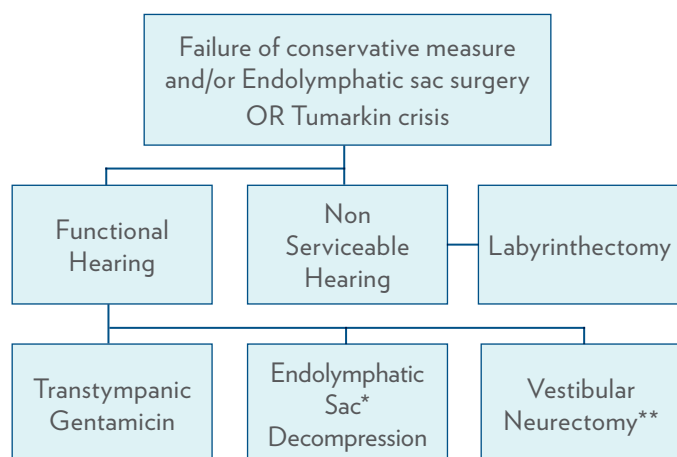
It may also act on the endolymphatic sac and cochlear microcirculation. The usual dose is 48 mg per day in two divided doses. However, two recent studies showed that high dose 48 mg tid for 6 to 12 months yielded good vertigo prophylaxis.⁵ In the United States, Betahistine does not have FDA approval but compounding pharmacies can usually provide it. In our institution, we consider it when patients fail medical management and transtympanic steroids, still have good hearing, and do not wish to proceed with surgery. Since it is not FDA approved, it can have a financial impact on the patient that is not negligible.

Surgical treatment of Ménière's disease

Patients with persistent vertigo despite conservative measures should be counseled about surgical and/or ablative options. Single hearing ears and bilateral Ménière's disease are relative contraindications for these methods.

Endolymphatic sac decompression

A recent systematic review showed good control of vertigo episodes. After endolymphatic sac decompression, the review noted that not using a silastic shunt was associated with better rates of hearing preservation.⁶



Assess vestibular function of contralateral side before any ablative procedure

Vestibular Neurectomy

This procedure is very efficient at controlling vertigo with the risk of hearing loss of less than five percent. However, the indications for a neurectomy (classically young patients with unilateral Ménière's disease and good hearing) are quickly receding in the face of the efficacy of transtympanic gentamicin, which carries a much lower morbidity.

Labyrinthectomy

Patients with intractable vertigo and poor, nonserviceable hearing, a labyrinthectomy should be offered. It is a definitive treatment with a vertigo cure rate approaching 100 percent. Appropriate vestibular rehabilitation will allow adequate vestibular compensation postoperatively. A labyrinthectomy does not preclude use of a cochlear implant for hearing rehabilitation.

Is there a role for vestibular rehabilitation?

Vestibular rehabilitation is usually reserved for patients with uncompensated vestibular hypofunction. Vestibular therapists treat according to identified impairment, and not to etiology. Referral to rehabilitation is advisable if there is interictal instability or uncompensated vestibular hypofunction (especially post-ablative procedures). It is also useful to treat comorbidities, such as BPPV, which is more prevalent in patients with MD compared to the general population.

In our clinic, we emphasize the role of the vestibular therapist from the beginning. We also send patients to physical therapy before a transtympanic gentamicin injection and before a labyrinthectomy. Higher patient compliance does correlate to more rapid and favorable outcome.

What about Vestibular Migraine?

It is estimated that almost 20 percent of patients consulting in a tertiary neurotology clinic for dizziness, will have vestibular migraine (VM). The criteria for this pathology have been recently defined by the Bárány Society.⁷ It is listed as a distinct migraine disorder in the Third edition of the International Classification of Headache Disorders (2018). The following table lists the criteria for definite and probable VM.⁷

Vestibular Migraine Treatment

The treatment of VM always starts with counseling about lifestyle modifications. The patient is instructed about dietary triggers (in our clinic a nutritionist is available) and is taught how to manage the diet appropriately to identify these triggers. Next, depending on the frequency of the episodes (typically if more than four a month), we discuss pharmacologic prophylactic treatment. There are many options to choose from, and all medications are off-label for the indication of vestibular migraine.

- **Nortriptyline:** If a patient has sleep problems and no significant cardiac history, we usually start VM

Criteria for Definite and Probable Vestibular Migraine

Definite	Probable
A. At least five episodes with vestibular symptoms* of moderate to severe intensity, lasting five minutes to 72 hours	A. At least five episodes with vestibular symptoms* of moderate to severe intensity, lasting five minutes to 72 hours
B. Current or previous history of migraine with or without aura according to the International Classification of Headache Disorders (ICHD)	B. Only one of the criteria B and C for vestibular migraine is fulfilled (migraine history or migraine features during the episode)
C. One or more migraine features with at least 50% of the vestibular episodes: Headache with at least two of the following characteristics: one sided location, pulsating quality, moderate or severe pain intensity, aggravation by routine physical activity Photophobia and phonophobia Visual aura	C. Not better accounted for by another vestibular or ICHD diagnosis
D. Not better accounted for by another vestibular or ICHD diagnosis	
*Vestibular symptoms defined by the Bárány Society's Classification include: spontaneous internal or external vertigo, positional vertigo, visually induced vertigo, head motion-induced vertigo as well as head motion-induced dizziness with nausea. Dizziness is defined as a sensation of disturbed spatial orientation.	

treatment with a trial of nortriptyline 20 mg qhs. This can be escalated up to 50 mg qhs. Common side effects are dry mouth and constipation and transient palpitations as well as weight gain.

- **Topiramate:** If a patient is obese and has no previous history of depression, topiramate is the drug of choice. It is carefully escalated from 25 mg qhs to 100 mg qhs. The major downside of topiramate is the cognitive side effects such as memory problems, attention and

concentration problems. Other side effects are weight loss, diarrhea, depressed mood and increased risk of nephrolithiasis (a history of nephrolithiasis is a relative contraindication to this medication). Topiramate also works as a carbonic anhydrase inhibitor and may lower intracranial hypertension if there is any suspicion of pseudotumor cerebri. Finally, unlike other antiepileptic drugs, topiramate has a minimal chance of adversely affecting oral contraceptive efficacy, especially at doses of 100 mg qd and lower.

- **Venlafaxine:** In patients with significant anxiety, venlafaxine 37.5mg qd is a good option. Side effects include insomnia, diarrhea and weight gain. Patients are told to start with half the dose, and to expect being tired for several weeks after starting the medication.
- **Beta-blockers:** Beta-blockers and specifically propranolol (up to 80 mg bid) and metoprolol (up to 50 mg bid) can be considered in patients without asthma, congestive heart failure or peripheral vascular disorders. Patients are asked to monitor their blood pressure and counseled about common side effects of fatigue, somnolence, decreased libido, depression, and insomnia.

Patients whose VM is associated with severe and frequent headaches, may be offered nerve blocks to help symptom control while starting a new prophylactic medication. In patients who fail more than two antimigraine preventive medications, and have more than 14 headaches of moderate intensity a month, a trial of Botox according to the PREEMPT protocol is indicated.⁹

While definite MD and definite VM have strict criteria and can be easily distinguishable, probable MD and probable VM are more nebulous conditions and may sometimes be confounded. In addition, migraines are often associated with MD:⁸ the lifetime prevalence of migraine in MD sufferers is 56 percent (75 percent in women). When criteria for MD are met, particularly the hearing loss documented by audiometry, MD should be diagnosed, even when migraines symptoms occur during the vestibular attacks. A subset of patients may fulfill criteria for both disorders with distinct types of attacks. Given that MD is often misdiagnosed or overdiagnosed, it is always advisable to **screen for migraines in patients with MD who are not responding to conservative treatment**, before proceeding with ablative procedures.

In conclusion, despite the absence of strong levels of evidence, and despite the fact that a grade A evidence-

based therapeutic algorithm is elusive, good clinical acumen and close follow-up of patients with MD will help determine optimal treatment regimens. An ongoing conversation with the patient, aimed at maximizing healthy lifestyle modifications and reducing anxiety, as well as identifying comorbid vestibular disorders (notably VM) that can often cloud the picture, have the best chance of improving quality of life. Ancillary interventions, especially vestibular rehabilitation will also prove valuable. Finally, vestibular therapists can evaluate the risk for falls and teach appropriate adaptation strategies. □

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Habib G. Rizk, M.D., MSc grew up in Beirut-Lebanon. He graduated from Notre-Dame de Jamhour College, summa cum laude with both a French and a Lebanese Baccalaureate. He then attended the French Faculty of Medicine-Saint Joseph University in Beirut Lebanon, for a seven-year medicine program, graduating in 2007.

Dr. Rizk pursued an Otolaryngology – Head and Neck Surgery residency at Hôtel-Dieu de France Hospital in Beirut, finishing in 2012. He then came to the USA, to Wilmington, Delaware and completed a one-year Otologic Medicine and Surgery Fellowship under the mentorship of Dr. Michael Teixido. Dr. Rizk then joined MUSC for a two-year Neurotology fellowship in 2013.

Dr. Rizk joined the Department in 2015 as Director of the Vestibular Program and established a Multidisciplinary Dizziness Evaluation and Management Program in Charleston.



Improving the Timeliness and Equity of Postoperative Radiation Following Surgery for Head and Neck Cancer

Evan M. Graboyes, M.D.

Head and neck cancer (HNC), which affects the tongue, jaw, voice box, throat, and neck, is the sixth most common cancer worldwide with 630,000 new diagnoses annually and 350,000 deaths/year. In the United States (US), over 65,000 patients are diagnosed with HNC each year and it causes more than 14,000 deaths per year. Delays in the delivery of HNC care are a major source of preventable mortality and contribute to worse survival in African American HNC patients. Locally advanced HNC,

which accounts for about two-thirds of newly diagnosed cases in the US each year, is often managed with sequential multimodal treatment such as surgery followed by postoperative radiation therapy (PORT). The time interval between surgery and PORT, which is recommended to be six weeks or less, is the key measure of timely care in HNC. It is the only measure of timely care in the National Comprehensive Cancer Network (NCCN) Guidelines for patients with HNC. In addition, delays starting PORT cause increased recurrence and decreased survival (**Figure 1**).

Even though delivering timely PORT is a critical component of quality, guideline-adherent HNC care, delays and racial disparities are nevertheless common. Ongoing research by our group highlighted the national scope of the problem in providing timely, equitable PORT following surgery for HNC. We analyzed 47,273 HNC patients treated across the nation from 2006 to 2014 and found that 55.7 percent of patients failed to start PORT in a guideline-adherent manner (within six weeks of surgery). Racial disparities in timely, guideline-adherent care existed, as 66 percent of African American HNC patients failed to start PORT within six weeks of surgery, a 1.3-fold increased risk of delayed care after adjusting for age, gender, insurance, education, comorbidity, stage, radiation modality, and facility treatment

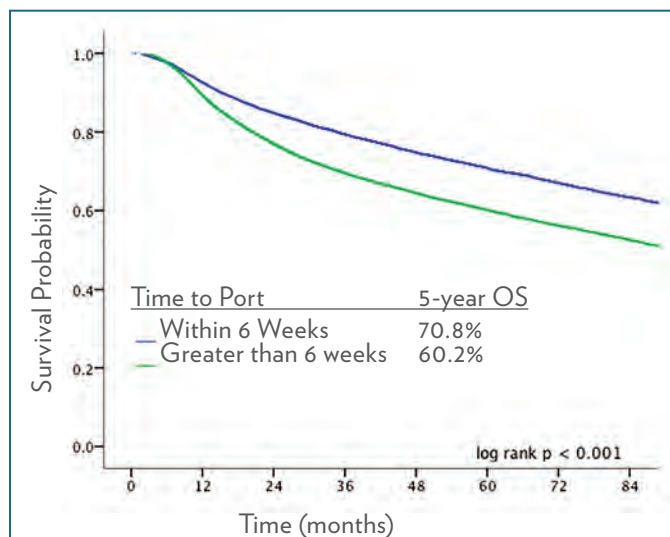


Figure 1. Effect of Delayed Initiation of PORT on Overall Survival

Risk Factor	Adjusted Odds Ratio (99 percent Confidence Interval)
Race	
White	1 (Reference)
African-American	1.31 (1.18-1.45)
Insurance	
Private	1 (Reference)
Medicaid	1.59 (1.44-1.75)
Uninsured	1.53 (1.35-1.73)
Education Level	
Highest Quartile	1 (Reference)
Lowest Quartile	1.30 (1.19-1.42)

Table 1. Patient-Level Risk Factors for Delayed PORT

type. Patients of low socioeconomic status were also found to be at high risk for delayed PORT (Table 1).

Postoperative radiation therapy following surgery for head and neck cancer should start within six weeks of surgery.

Delays and racial disparities starting PORT also negatively impact survival. Additional research by our team using a nationwide sample of 41,291 HNC patients treated from 2006 to 2014 showed that delays in PORT were associated with an 11 percent absolute decrease in five-year overall survival and a 15 percent relative increased risk of mortality after adjusting for a number of variables including age, race, comorbidity, insurance, education, stage, and treatment. The survival benefit from starting PORT in a timely fashion is large and comparable in magnitude to the benefit seen with the addition of Cisplatin to PORT in landmark HNC adjuvant therapy trials.

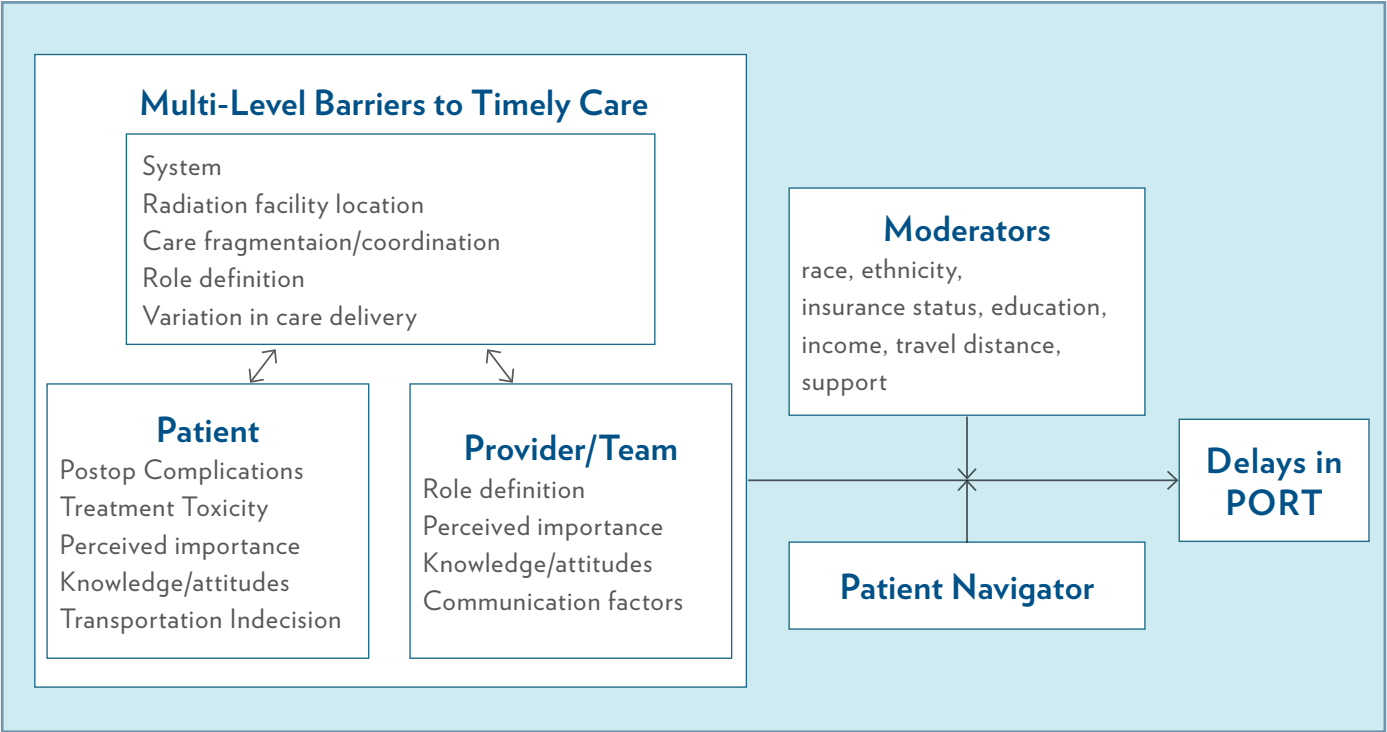

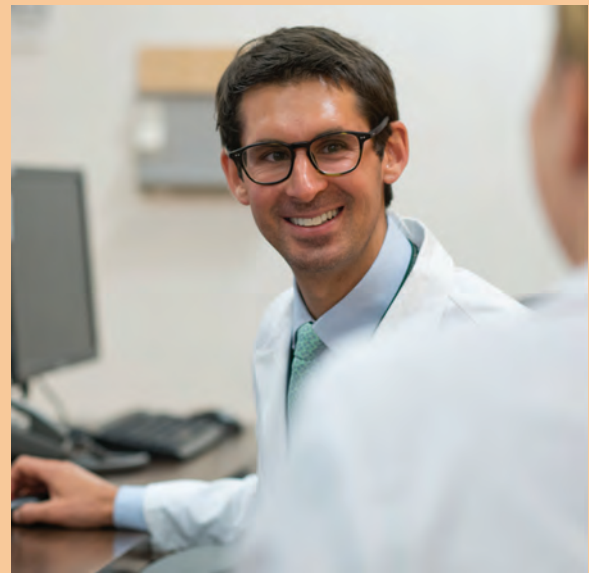


Figure 2. Conceptual Model of Barriers Causing Delays and Inequities in PORT

Although improving the delivery of timely, equitable PORT is a problem of national significance, it is one that is best studied in South Carolina where the age-adjusted incidence of HNC in African Americans is 2.5-fold higher than the national average and the age-adjusted mortality rate is 29 percent higher. Research by our team demonstrated that 45.2 percent of patients undergoing HNC surgery at the Medical University of South Carolina (MUSC) and PORT from 2014 to 2016 experienced delays starting PORT. Delays in PORT at MUSC were disproportionately experienced by racial minorities as 56.8 percent of African Americans had a delay relative to 43.3 percent for whites. As part of this work, our team also identified numerous processes of care associated with timely PORT (such as having PORT at MUSC, having a consultation with radiation oncology prior to surgery, timely dental extractions, and issuing the pathology report within seven days of surgery). However, racial differences in receipt of these processes of care do not explain the observed racial disparities in timely PORT, suggesting that there are undescribed barriers to timely care that disproportionately burden African American HNC patients causing delays in PORT.

Delays starting radiation following HNC surgery are common, primarily affect African American patients, and cause worse survival.

Although the risk factors and impact of delayed HNC care have been examined, there is a gap in our understanding of the barriers to timely PORT. As a result, effective strategies to provide timely, equitable HNC care remain unknown. Our group is currently conducting additional research to identify the patient-, provider-, and system-level barriers that contribute to delays and racial disparities in timely HNC care (**Figure 2**). We are using these data about barriers to timely care to design and implement a novel patient navigation intervention for HNC patients undergoing surgery followed by PORT. We expect that successful completion of this research will have a significant impact on the quality of oncology care delivered to HNC patients by decreasing delays and racial disparities in care, thereby promoting health equity and improving survival. 



Evan M. Graboyes, M.D. is a head and neck oncologic surgeon specializing in microvascular free tissue transfer. Born in St. Louis, Missouri and raised in Wisconsin, Dr. Graboyes graduated summa cum laude from Princeton University with a degree in Philosophy. He then moved to St. Louis where he completed his medical degree and residency from Washington University School of Medicine. He completed his fellowship in head and neck oncologic and reconstructive surgery at MUSC.

Dr. Graboyes' clinical practice is focused on the comprehensive management of patients with head and neck tumors. Specific areas of expertise include removal and reconstruction of cancers of the upper aerodigestive tract and skin of the head and neck.

Dr. Graboyes' research is dedicated to patient-centered outcomes and improving the quality of head and neck cancer care delivery. He has published over 40 peer-reviewed articles and book chapters. He is a member of numerous national committees for the American Academy of Otolaryngology-Head and Neck Surgery as well as the American Head and Neck Society.

Phase II Investigator Initiated Trial of Nivolumab as a Novel Neoadjuvant Pre-Surgical Therapy for Locally Advanced Oral Cavity Cancer

David M. Neskey, M.D., MSCR, FACS

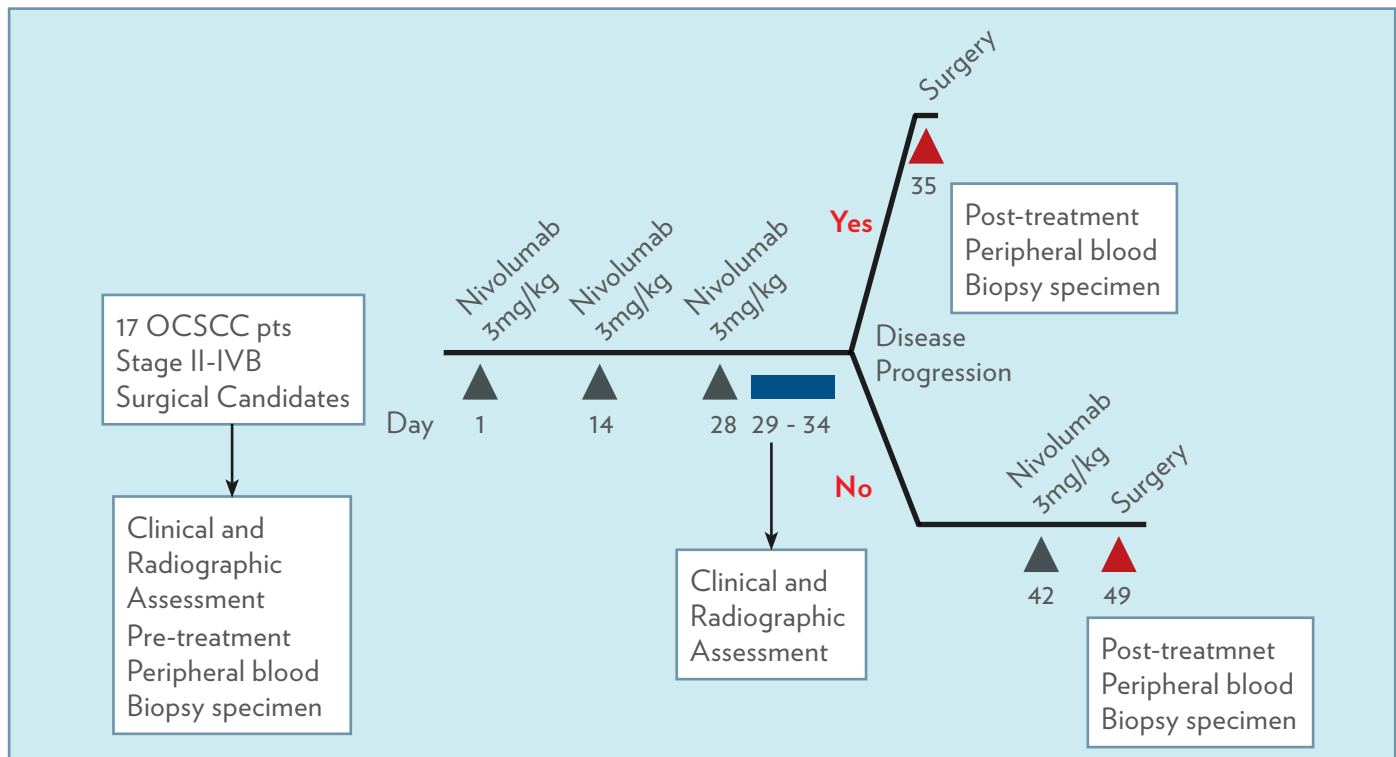


Figure 1: Study Schema. Clinical trial design for pre-surgical neoadjuvant Nivolumab in patients with previously untreated locally advanced oral cavity cancer.

Squamous cell carcinoma of the head and neck (HNSCC) is an aggressive malignancy that is the sixth most common neoplasm in the world¹. Despite advances in treatments involving surgery, radiation, and chemotherapy, the five-year survival remains approximately 50 percent. Treatment of advanced HNSCC requires complex, multimodality therapy, employing either definitive radiation with or without chemotherapy or surgical resection and post-operative radiation, with chemotherapy for patients with high-risk of recurrence^{2,3}.

Neoadjuvant therapy is now being applied in multiple cancer types and has provided a new paradigm in the treatment of patients with breast and esophageal cancer in terms of overall and disease-free survival⁴⁻⁷. Neoadjuvant treatment prior to definitive surgery to determine clinical efficacy and define molecular biomarkers predictive of response has been tested in several studies⁸⁻¹¹. In general, the potential benefits

of effective neoadjuvant therapies include:

- the assessment of clinical response to novel, mechanism-based treatment options which can decrease tumor burden and thus reduce the extent of surgery¹²
- the exploration of molecular changes in cancer cells and surrogate tissues, such as blood, may provide valuable biomarkers to identify patients that may benefit the most from new targeted therapies¹³.

A clinical response to neoadjuvant chemotherapy has prognostic value in multiple cancers, as pathologic complete response at the time of surgery is a recognized and validated surrogate marker for good clinical outcome^{14,15}.

Because of the combination for the need of new therapies and the benefits of a neoadjuvant treatment strategy, the possibility of immunotherapeutic approaches for HNSCC patients has gained interest. Unfortunately, HNSCC

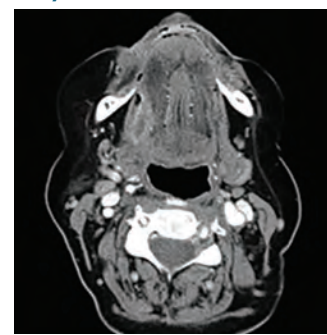
patients have profound immune defects that are associated with a worse outcome and have been attributed to tumor production of inhibitory mediators and tumor-induced immune inhibitory cell populations¹⁶⁻²¹. Programmed Death receptor 1 (PD-1) and its ligand (PD-L1) appear to contribute to this immune dysfunction as 50 to 60 percent lymphocytes from HNSCC patients have upregulated PD-1 expression and PD-1 blockade enabled lymphocyte proliferative reactivity to stimulation and indirectly overcame immune unresponsiveness by modulating immune inhibitory populations, including T regulatory cells²¹⁻²⁴. Furthermore, tumor PD-L1 expression has been associated with improved objective response and clinical benefit in multiple tumor types²⁵. Most recently the Checkmate 141 Phase III trial revealed in patients with treatment-resistant and rapidly progressive head and neck carcinoma that Nivolumab treatment was associated with an improved 12-month overall survival of 36 percent, compared with 17 percent in the Investigator Choice arm. Based on these findings we have an ongoing Phase II Trial of Nivolumab, a Anti-PD-1 Monoclonal Antibody, As a Novel Neoadjuvant Pre-surgical Therapy for Locally Advanced Oral Cavity Cancer. The primary endpoint of this trial is to determine the efficacy neoadjuvant pre-surgical PD-1 inhibition. Patients with newly diagnosed oral cavity cancer without evidence of distant metastases are eligible to enroll. Eligible patients will undergo an initial evaluation including clinical and radiographic assessment along with pre-treatment peripheral blood and tumor biopsy collection. They will subsequently receive three doses of Nivolumab every two weeks. Following the third dose patients will undergo another clinical and radiographic assessment. If there is evidence of stable disease or clinical response, patients will go on to receive a fourth dose of Nivolumab followed by definitive surgery. If there is evidence of disease progression they will forgo the fourth dose and proceed directly to surgery (**Figure 1**). Since 60 to 80 percent of OCSCC express PD-L1, it is anticipated PD-1 blockade will benefit 20 to 25 percent of patients with OCSCC^{21,24,25}.

The trial opened in June 2017 with an anticipated accrual of 17 patients. As of June 2018, seven patients have enrolled, five have completed therapy, and two are on treatment. To date the treatment has been very well tolerated without only Grade 1 toxicities being report the most frequent of which has been fatigue (**Table 1**). The first patient presented with a cT2N0M0 squamous cell carcinoma of the right lateral tongue (**Figure 2**). After enrollment, she received three doses of Nivolumab and had partial response (**Figure 3**).

System	Event Name	Grade 1	Grade 2
Gastrointestinal	Constipation	1	0
Gastrointestinal	Nausea	1	0
Respiratory	Cough	1	0
Musculoskeletal	Myalgia	1	0
Musculoskeletal	Swollen right hand	1	0
General	Fatigue	2	0
General	Pain	1	0
Infection	Otitis media	1	0
Investigations	Weight loss	1	0

Table 1. Frequency of toxicities associated with neoadjuvant Nivolumab therapy.

Day 1. 1.1x2.5x2.1 cm



cT2NOMO

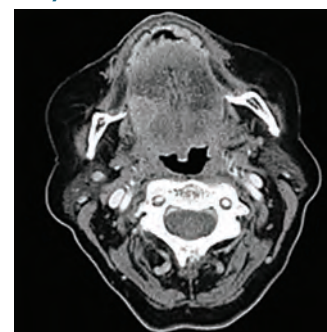


Figure 2. Pretreatment radiographic and clinical assessment of a patient enrolled into trial.

A. Contrasted CT scan revealing lateral tongue lesion 2.4 cm in greatest dimension.

B. Photograph of oral tongue lesion demonstrating an endophytic mass with superficial ulceration.

Day 32. 1.4.0x2.0x1.7 cm



cT2NOMO



Figure 3. Assessment following three doses of Nivolumab.

A. Contrasted CT scan revealing lateral tongue lesion 2.1 cm in greatest dimension.

B. Photograph of oral tongue lesion demonstrating a healed superficial ulceration.

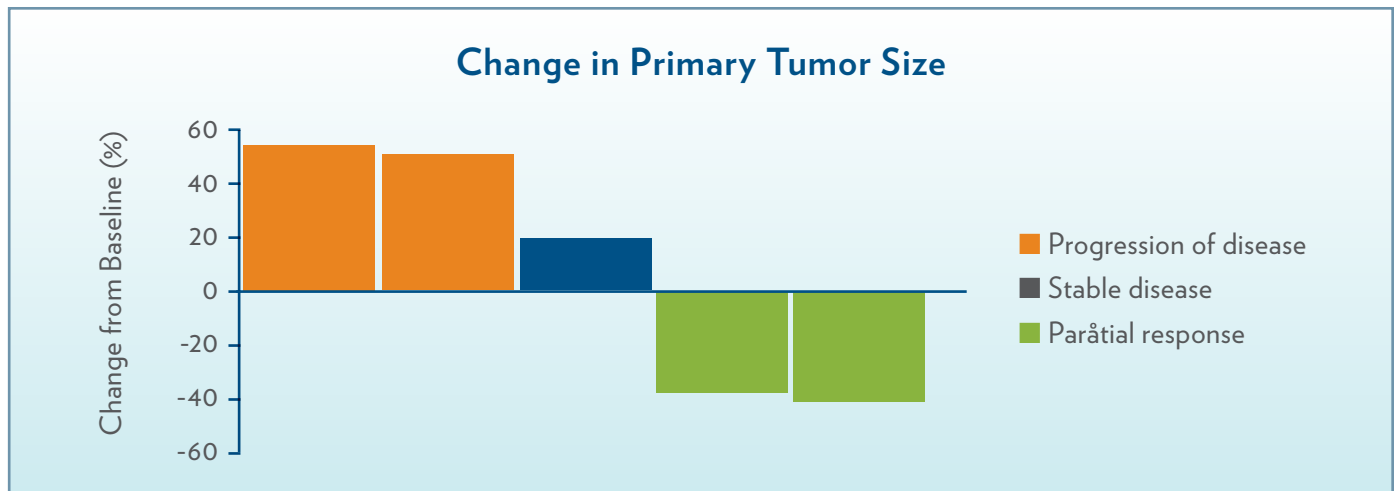


Figure 4. Waterfall plot of five patients currently in follow-up. Initial results reveal two patients with partial response, one with stable disease, and two with disease progression.

After receiving her fourth dose she underwent definitive surgical resection where the final pathology revealed a tumor 1.5 cm in greatest dimension which represents a 40 percent reduction in tumor size. Of the five patients who are currently in follow up, we have observed two patients with partial responses, one with stable disease, and two patients with progression (**Figure 4**). Although these initial results are encouraging, the potential impact of pre-surgical neoadjuvant will not be determined until additional patients are enrolled. Furthermore, additional studies will be necessary to determine the potential benefit of neoadjuvant immunotherapy on survival for patients with head and neck cancer.

In addition to our primary endpoints, we are also undertaking correlative studies in an effort to identify predictive biomarkers of immune response within the peripheral blood, tumor infiltrating lymphocytes (TIL) or tumor from patients enrolled in the trial. Our central hypothesis is neoadjuvant pre-surgical PD-1 inhibition will trigger a memory phenotype in TIL and lead to epigenetic changes within both tumor and T cells that will correlate with clinical response and improved survival in patients with oral cancer. Confirmation of this hypothesis will enable the identification of patients who will most benefit from PD-1 blockade resulting in improved survival. □

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David M. Neskey, M.D., MSCR, FACS joined the Department of Otolaryngology in the division of Head and Neck Surgical Oncology in 2014. Originally from Massachusetts he received his medical degree from Albany Medical College with a distinction in research in 2006 followed by a residency in Otolaryngology Head and Neck Surgery at the University of Miami. He then completed a fellowship in head and neck surgical oncology at MD Anderson Cancer Center in Houston. This training experience was comprised of two years dedicated to basic science research followed by a year committed to the management of head and neck cancer patients.

Dr. Neskey's clinical focus is on the care of patients with benign and malignant neoplasias of the head and neck including oral cavity, oropharyngeal, and laryngeal lesions, advanced melanoma and nonmelanoma skin cancers, and lesions of the



salivary glands, thyroid and parathyroids.

In addition to his interest in clinical trial development, Dr. Neskey has an independently funded laboratory through the NIH where his research focuses on the molecular pathways and genomic alterations associated with invasion and metastases in head and neck cancer. He is currently funded by the NIH to study the mechanisms of invasion and metastases in head and neck cancer.

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Clinical Trials



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Clinical Research Fellows

Shaun A. Nguyen, M.D., FAPCR

As of the 2017-2018 academic year, ten classes of research fellows had been selected, totaling more than 60 students. Under the direction of Dr. Shaun Nguyen and MUSC ENT Faculty, research fellows and residents made an impressive educational footprint at the Fall 2015 AAO-HNSF Annual

Meeting with 26 oral presentations. The MUSC Clinical Research Fellowship Program is endowed by Drs. Felizardo Camilon and Althea Molarte, and Mr. Deming Xiao and Mrs. Julia Chu.



Prashant Bhenswala, M.D., MSCR
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Tyler Janz, MS4
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Kimia Ganjaei, MS4
Robert Wood Johnson
Medical School, NJ



Anvesh Kompelli, MS4
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Heather Schopper, MS4
University of Iowa

Current Clinical Trials

Shaun A. Nguyen, M.D., FAPCR, Clinical Research Director

Phase I

A first-in-human, open-label and single-dose study to assess safety and tolerability of topical otic administration of UKG489 in adult healthy volunteers.

Acute Hearing Loss

Efficacy and safety of AM-111 as acute sudden sensorineural hearing loss treatment (ASSENT).

Eustachian Tube Dysfunction

XprESS Eustachian tube dilation study - Long term Follow-up.

Ménière's Disease

A phase 2B, randomized, double blind, placebo-controlled study to evaluate the safety and efficacy of SPI-1005 in Ménière's disease.

A Prospective, Randomized, Double Blind, Placebo-Controlled, Multicenter, Phase 3 Efficacy and Safety Study of OTO-204 Given as a single intratympanic injection in subjects with unilateral Meniere's disease.

Vestibulopathy

A multicenter, randomized, double-blind, placebo-controlled study to assess the efficacy and safety of two dose regimens of orally administered SENS-111 (100 mg and 200 mg) given during four days in patients suffering from Acute Unilateral Vestibulopathy.

Chronic Sinusitis

A phase III, randomized, multicenter, double-blind, placebo-controlled clinical trial of omalizumab in patients with chronic rhinosinusitis with nasal polyps.

An Open-Label Extension Study of Omalizumab in patients with chronic rhinosinusitis with nasal polyps.

A randomized, 24-week treatment, double-blind, placebo-controlled efficacy and safety study of dupilumab 300 mg in patients with bilateral nasal polyposis.

A randomised, double-blind, parallel group phase 3 study to assess the clinical efficacy and safety of SC mepolizumab in maintenance treatment for adults with severe bilateral nasal polyps.

A Multicenter, Randomized, Double-Blind, Parallel-Group, Placebo-Controlled Phase 3 Efficacy and Safety Study Of Benralizumab in Patients with Severe Nasal Polyposis (OSTRO).

Obstructive Sleep Apnea

Targeted hypoglossal neurostimulation study #3 (THN3).

Adherence and Outcome of Upper Airway Stimulation (UAS) for OSA International Registry.

Snoring

Snoring intervention via elevoplasty in a non-surgical clinical environment (S.I.L.E.N.C.E.) study.

Head and Neck Cancer

A phase 1b/2, open-label, multicenter, dose-escalation and expansion trial of intratumoral SD-101 in combination with pembrolizumab in patients with metastatic melanoma or recurrent or metastatic H&N cancer.

A randomized phase II study of adjuvant concurrent radiation and chemotherapy versus radiation alone in resected high-risk malignant salivary gland tumors.

Phase II randomized trial of transoral surgical resection followed by low-dose or standard-dose IMRT in resectable p16+ locally advanced oropharynx cancer.

Phase II trial of nivolumab, an anti-PD-1 monoclonal antibody, as neoadjuvant pre-surgical therapy for locally advanced oral cavity cancer.

Clinical Evaluation of the OncAlert® RAPID in subjects presenting for revaluation and/or initial biopsy; impact on decision-making.

Pediatric

Randomized Controlled Trial of Valganciclovir for Asymptomatic Cytomegalovirus Infected Hearing Impaired Infants (ValEAR Trial).

A 16-Week Randomized, Double-Blind, Placebo Controlled, Parallel-Group, Multicenter Study Evaluating the Efficacy and Safety of OPN-375 186 µg Twice a Day (BID) in Adolescents with Bilateral Nasal Polyps.



On behalf of SPI, I would like to congratulate you and your colleagues at MUSC on the recognition as a top ranked ENT Department by US News and World Reports. We are honored to be collaborating with you and your clinicians, residents, and staff on several studies that are advancing a novel therapy for the prevention and treatment of several neurotologic indications. At SPI we understand how important that is with:

- 4 investigational new drug applications with the FDA
- 3 completed clinical trials and 2 ongoing clinical trials in Ototoxicity and Ménière's disease
- Phase 2 safety and efficacy of SPI-1005 in preventing noise induced hearing loss was recently published in *The Lancet*
- Several active collaborations with leading U.S. academic centers
- Strong history of collaborative funding from DoD and private foundations

Jonathan Kil, M.D., Co-Founder, CEO and CMO

Upcoming CME Events

18th Annual Charleston Magnolia Conference

June 1-2, 2018

Two half-day sessions covering the broad spectrum of Otolaryngology – Head and Neck Surgery. The lectures and round table discussions are specifically aimed at the practicing otolaryngologist. There will be ample opportunity for questions, comments, and presentation of cases by the audience. Our goal will be to review and to provide the latest information on a broad range of topics, so that optimal diagnostic and management strategies can be formulated.

Keynote Speakers:

John Dornhoffer, M.D., University of Arkansas for Medical Sciences, Little Rock, AR

Gaelyn Garrett, M.D., Vanderbilt University, Nashville, TN

Andrew Murr, M.D., UCSF School of Medicine, San Francisco, CA

The Charleston Course, 8th Annual Otolaryngology Literature Update

July 13 - 15, 2018 Kiawah Island Golf Resort

This course is designed to help the busy clinician stay current in our rapidly expanding specialty. Fifteen of our faculty members are charged with reviewing last year's literature and choosing six to eight best articles in their subspecialty for critical review. In three days, more than 100 manuscripts will be reviewed, and those "pearls" important to your practice will be emphasized. There may be no better way to stay current in our field than with this Literature Update Course!

The Charleston Vestibular Conference: 2018 Update

November 2 - 3, 2018 MUSC Campus

This one and a half day intermediate conference is designed for all providers involved in the care of patients with vestibular disorders (audiologists, neurotologists, otolaryngologists, primary care physicians, advanced practice providers, VNG/ENG technicians and physical therapists). The course will cover key topics on evaluation and management of dizzy patients. Our objective is to provide the attendees with up-to-date knowledge in this field and to enable them to employ best current practices when servicing this population.

Keynote Speaker: **Michael Teixido, M.D.**, Thomas Jefferson University, University of Pennsylvania, Wilmington, DE

33rd Annual F. Johnson Putney Lectureship in Head and Neck Cancer

November 2, 2018 MUSC Campus

This half day lectureship will bring together world class Head & Neck specialists to discuss improving the quality of health care for patients with head and neck cancer.

F. Johnson Putney Lecturer in Head & Neck Cancer:

Cherie-Ann Nathan, M.D., FACS, LSU Health-SHV, Shreveport, LA

The Charleston Pharyngoesophageal Manometry Program

January 18-19, 2019

This day and a half course provides in-depth training on the utilization of high resolution manometry for the evaluation and management of pharyngeal and esophageal dysphagia. Designed for speech pathologists and otolaryngologists, we will cover pharyngeal and esophageal diagnostic examinations and the use of HRM for biofeedback in dysphagia therapy. A hands on laboratory session provides real time instruction and software interpretation practice.

Keynote Speaker: **Gregory Postma, M.D.**, Augusta University Medical Center, Augusta, GA

The 6th Annual Charleston Pediatric ENT Update

February 2019 Courtyard Charleston Historic District

A comprehensive full day course designed to provide pediatricians, family practitioners, and otolaryngologists with up-to-date guidelines to implement in their daily practice, promote quality and efficient care, and tackle challenging ENT diagnosis with confidence.

The ABCs of Maxillofacial Prosthodontics Medical and Dental Billing

March 8, 2019

This one day course is designed for dentists, prosthodontists, and maxillofacial prosthodontists. Topics will include: precertification, financial counseling, coding, reimbursement, compliance, managed care, billing, dictation templates, facility/supply billing, and integration of maxillofacial prosthodontic billing into the hospital system.

The 18th Temporal Bone Dissection Course

Spring 2019 MUSC Campus

An intensive two-day otology course that offers lectures and hands on labs focused on procedures for chronic ear disease. For practicing otolaryngologists.

Southern States Rhinology Course

Spring 2019 Kiawah Island and MUSC Campus

This course is intended for practicing Otolaryngologists and will feature presentations on topics for the practicing rhinologists and sinus surgeons. A hands-on laboratory dissection is available, featuring state-of-the-art endoscopic instrumentation, video, and image guidance systems.

19th Annual Charleston Magnolia Conference

May 31 - June 1, 2019

The Charleston Course, 8th Annual Otolaryngology Literature Update

July 12 - 13, 2019 Kiawah Island Golf Resort

Some 2019 details are still in the works! Visit our website for updates: musc.edu/ent/cme
For course registration or more information: Julie Taylor, taylojul@musc.edu or 843-876-0943



Ranked #11 in the Country

The MUSC Department of Otolaryngology - Head & Neck Surgery continues to rank among the elite programs in the country in education, clinical research and clinical trials, basic research, and patient care. "We take enormous pride in this special Department, but acknowledge that our Department does not function in isolation, and thus we applaud the leadership and infrastructure provided by MUSC and our amazing colleagues across the enterprise."

Paul R. Lambert, M.D.
Professor and Chair
Department of Otolaryngology - Head & Neck Surgery
Director, Otology & Neurotology

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THE MEDICAL UNIVERSITY OF SOUTH CAROLINA

Founded in 1824 in Charleston, The Medical University of South Carolina is the oldest medical school in the South. Today, MUSC continues the tradition of excellence in education, research, and patient care. MUSC educates and trains more than 3,000 students and residents, and has nearly 13,000 employees, including approximately 1,500 faculty members. As the largest non-federal employer in Charleston, the university and its affiliates have collective annual budgets in excess of \$2.2 billion. MUSC operates a 750-bed medical center, which includes a nationally recognized Children's Hospital, the Ashley River Tower (cardiovascular, digestive disease, and surgical oncology), Hollings Cancer Center (one of 68 National Cancer Institute designated centers), Level I Trauma Center and Institute of Psychiatry.

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