Welcome to the

AHNS ANNUAL MEETING AT

COSM 2022 DALLAS

HYATT REGENCY DALLAS | DALLAS, TX

•

April 27-28, 2022

FINAL PROGRAM

Held During the Combined Otolaryngology Spring Meetings

AHNS President: Bert W. O'Malley, Jr., MD
Program Co-Chairs: James Rocco, MD &
Jeffrey Liu, MD

THE RESEARCH AND EDUCATION FOUNDATION OF THE AMERICAN HEAD AND NECK SOCIETY

Since the time of its founding in 1991, the society and its members have made generous gifts to the Foundation, transforming it from a nascent organization to one which now supports all the key research awards offered by the AHNS.

It has taken nearly 30 years for the AHNSF to reach this benchmark and we are poised to catapult the Foundation to a new stage of maturity, one that will allow us to fund larger initiatives – **with your help**.

We welcome gifts in any amount, and one of the easiest ways to donate is via your annual dues renewal. Alternatively, we ask you to consider supporting at one of two distinctive giving levels –

Centurion Club – annual minimum donation of $1,000

Five in Five - $5,000 a year for five years

A manuscript published in JAMA detailed the success of the AHNS grant program. In general terms, grant recipients have gone on to publish manuscripts on their work, advance in their careers and receive an infusion of funding from other sources based on the initial grant awarded by the society.

We ask you to join us in honoring the work of those who have gone before us and encourage the work of the next generation of head and neck thought leaders. Each contribution lifts us higher, closer to those on whose shoulders we stand.

For more information about the Foundation, or to make your gift today, go to www.ahnsfoundation.info or please come and visit the Foundation's Centurion Club Lounge.

Sincerely,

Dennis Kraus, MD
Foundation Chair

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THANK YOU TO OUR EDUCATIONAL SUPPORTERS

The American Head and Neck Society gratefully acknowledges educational grants in support of the annual meeting from the following organizations:

Intuitive Surgical

Castle Biosciences
Karl Storz Endoscopy America
Medtronic

Cook Medical
KLS Martin
Naveris

THANK YOU TO OUR EDUCATIONAL SUPPORTERS

The American Head and Neck Society gratefully acknowledges in-kind contributions in support of the Ultrasound Course from **RGS Healthcare**

SAVE THE DATE!
AHNS FUTURE MEETING SCHEDULE

AHNS 11th International Conference on Head and Neck Cancer
July 8 - 12, 2023 • Québec, Canada
The Palais Des Congrès, Montréal

AHNS 2024 Annual Meeting Held during the Combined Otolaryngology Spring Meeting (COSM)
May 15 - 19, 2024 • Chicago, Illinois
Hyatt Regency Chicago

The American Head & Neck Society (AHNS)
11300 W. Olympic Blvd., Suite 600
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The American Head & Neck Society is managed by
BSC Management, Inc.
Phone: (310) 437-0555
Fax: (310) 437-0585
E-Mail: info@bscmanage.com
www.bscmanage.com

Official Language

The official language of the conference is English. Simultaneous translation will not be offered.

GENERAL INFORMATION

The American Head and Neck Society's 2022 Annual Meeting
April 27-28, 2022 • Hyatt Regency • 300 Reunion Blvd, Dallas, TX 75207

COSM Registration Hours

Lobby Level

Tuesday, April 26	12:00 pm - 5:00 pm
Wednesday, April 27	6:30 am - 5:00 pm
Thursday, April 28	6:30 am - 5:00 pm
Friday, April 29	7:00 am - 5:00 pm
Saturday, April 30	7:00 am - 3:00 pm
Sunday, May 1	7:00 am - 10:00 am

COSM Exhibit Hall Hours

Marsalis Hall

Coffee breaks and lunch will be served in the Exhibit Hall (Wednesday and Sunday excluded).

Thursday, April 28	9:00 am - 4:00 pm
Friday, April 29	9:00 am - 4:00 pm
Saturday, April 30	9:00 am - 4:00 pm

Speaker Ready Room Hours

Cumberland K

Tuesday, April 26	4:00 pm - 8:00 pm
Wednesday, April 27	6:00 am - 6:00 pm
Thursday, April 28	6:00 am - 6:00 pm
Friday, April 29	6:00 am - 6:00 pm
Saturday, April 30	6:00 am - 4:00 pm
Sunday, May 1	6:00 am - 10:00 am

Poster Hall

All posters are displayed in Marsalis Hall.
View/search all posters via the App or COSM's Poster Archive via www.cosm.md.

Wednesday, April 27	1:00 pm - 7:00 pm
Thursday, April 28	9:00 am - 7:00 pm
Poster Reception (*AHNS only*)	
Thursday, April 28	5:00 pm - 6:00 pm

AHNS Centurion Club Lounge

Room Baker

Wednesday, April 27, 2022	7:00 am - 5:00 pm
Thursday, April 28, 2022	7:00 am - 5:00 pm

Questions? Comments?
Join the conversation behind the scenes ...
Tweet! #AHNS2022 **Follow us** @AHNSinfo

GENERAL INFORMATION

AHNS 2022 ANNUAL MEETING EDUCATIONAL OBJECTIVES

At the conclusion of the activity, participants will be able to:

1. Better evaluate interventions in relation to their value in the management of head and neck cancer patients.
2. Discuss the value proposition for proton vs. intensity-modulated radiation therapy (IMRT) in cancers of the oropharynx, skull base and salivary glands.
3. Articulate the fundamentals of immunotherapy relative to value in the management of the head and neck cancers.
4. Recognize the expected quality of life outcomes in skull base surgery.
5. Differentiate between the current trends and practices in endocrine disease treatment relative to quality and value.
6. Discuss treatment protocols for advanced larynx cancer.
7. Discriminate between the modalities to diagnosis HPV-positive/HPV-negative mucosal disease of the head and neck.
8. Interpret how value based head and neck cancer care affects patient quality, outcomes and economics of practice.
9. Identify differences in remote access thyroidectomy versus traditional open approach.
10. Review the nuances for the meaning of traditional high-risk factors in HPV-positive oropharynx cancer.
11. Discuss the role of sentinel lymph node in cutaneous squamous cell cancer and melanoma.
12. Debate the role of biomarker in treatment of salivary gland cancers.

AHNS 2022 CME CREDIT CLAIM PROCESS

Please use the worksheet on page 23 to track the number of CME hours you attend for each activity. After the meeting, an email will be sent to attendees with a link to the on-line survey and claim form.

For any questions, please contact miranda@ahns.info.

TO RECEIVE YOUR CME CREDIT:

AHNS has instituted a process for claiming CME credits and printing certificates. All attendees wishing to receive a CME certificate for activities attended at the AHNS 2022 Annual Meeting must first complete an on-line meeting evaluation form. An email will be sent to attendees with a link to the on-line survey and claim form.

ATTENDANCE CERTIFICATES

General certificates of attendance will be emailed to participants upon request. Please contact miranda@ahns.info for your certificate. Note, this will not include your claimed CME credits.

AMERICAN HEAD & NECK SOCIETY STATEMENT OF PROFESSIONALISM AND ETHICS

The American Head and Neck Society is committed to promulgating and promoting professionalism and ethical behavior in its membership. As members, we value the trust placed in us by our patients, colleagues and society, and therefore willingly pledge to uphold the ethical and professional principles and virtues of medicine as outlined below.

We have a fundamental and sacred duty to our patients. Therefore, we will:

- Recognize that the welfare of our patients is the paramount priority.
- Serve as advisors to our patients to help them navigate complex medical decisions.
- Discuss the risks, benefits and alternatives of appropriate therapeutic options.
- Be respectful of our patients' viewpoints and beliefs.
- Support our patients physically, emotionally and spiritually.
- Care for and support our patients at the end of life.
- Offer support and care to our patients' families.
- Strive to enhance and maximize our clinical, surgical and interpersonal competence.
- Maintain a caring and respectful demeanor.
- Offer care without regard to gender, age, religion, sexual orientation, socioeconomic status or ethnicity.

We have a responsibility to our colleagues and teachers. Therefore, we will:

- Willingly acknowledge our skills and expertise to those wishing to learn.
- Honor our teachers for devoting their time and energy on our behalf.
- Assist our colleagues, technically, intellectually, emotionally and spiritually.
- Respect our colleagues from other disciplines and practice multidisciplinary care.
- Provide legal opinions based only on evidenced-based practice and standards of care.

We also have an obligation to the faith entrusted in us by society. Therefore, we will:

- Perform self regulation by developing and adhering to professional, ethical and evidence-based practice standards.
- Disclose and limit conflict of interest.
- Practice medicine honestly, compassionately and confidentially.
- Educate the public within the bounds of our expertise.

AMERICAN HEAD & NECK SOCIETY

Mission

The mission of the AHNS is to advance Education, Research, and Quality of Care for the head and neck oncology patient

Why Join AHNS?

The American Head and Neck Society is an organization of physicians, scientists and allied health professionals dedicated to improving the understanding of Head and Neck Cancer and the care of patients afflicted with that disease. Membership is open to a wide variety of interested individuals in several categories that differ both in terms of responsibility and level of involvement in the society.

Benefits of AHNS Membership

- *Member rates on all meeting registration fees*
- *Interaction with our worldwide network of surgeons, physicians and health care professionals dedicated to the prevention and treatment of head and neck cancer*
- *Ability to apply for research grant awards*
- *Opportunity to participate on services and in leadership positions*

Membership Categories:

Active	Associate	Resident	International
(Physician)	*(RN, PA, Researchers, Etc...)*	*(Formerly called Candidate)*	*(Formerly called Corresponding)*

For more information about AHNS membership, and to apply:
Please visit our website at www.ahns.info/member-central
Questions? Call +1-310-437-0559, ext. 126 or Email Membership@ahns.info

ABOUT THE AMERICAN HEAD AND NECK SOCIETY

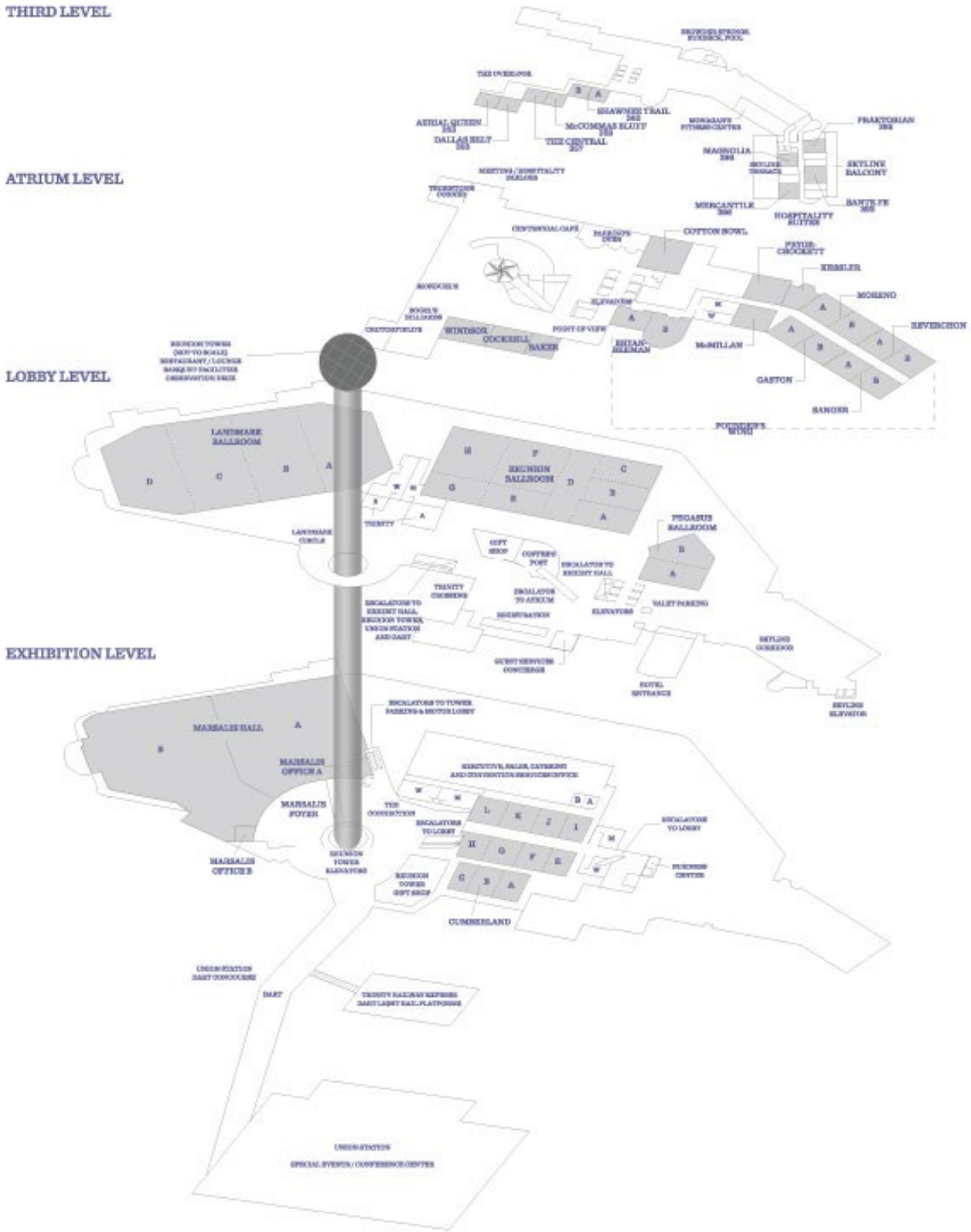
History of the Society

On May 13, 1998, The American Head and Neck Society (AHNS) became the single largest organization in North America for the advancement of research and education in head and neck oncology. The merger of two societies, the American Society for Head and Neck Surgery and the Society of Head and Neck Surgeons, formed the American Head and Neck Society.

The contributions made by the two societies forming the AHNS are significant in the history of surgery in the United States. Dr. Hayes Martin conceived the Society of Head and Neck Surgeons in 1954, a surgeon considered by many to be the "father of modern head and neck tumor surgery." The purpose of the society was to exchange and advance the scientific knowledge relevant to the surgery of head and neck tumors (exclusive of brain surgery) with an emphasis on cancer of the head and neck. Two years later, The American Society for Head and Neck Surgery was organized with the goal to "facilitate and advance knowledge relevant to surgical treatment of diseases of the head and neck, including reconstruction and rehabilitation; promote advancement of the highest professional and ethical standards as they pertain to the practice of major head and neck surgery; and to honor those who have made major contributions in the field of head and neck surgery, or have aided in its advancement".

The new Society remains dedicated to the common goals of its parental organizations.

HYATT REGENCY FLOOR PLANS



AHNS PRESIDENT

Bert W. O'Malley, Jr., MD

In addition to President of the American Head and Neck Society, Dr. O'Malley serves as President and CEO of the University of Maryland Medical Center (UMMC) as well as Professor of Otorhinolaryngology-Head & Neck Surgery within the University of Maryland School of Medicine.

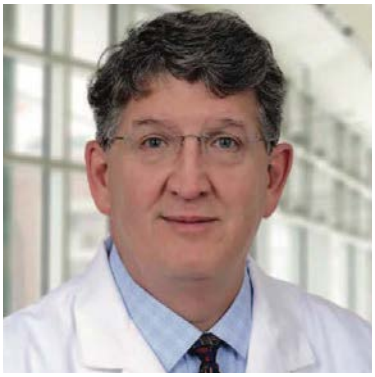
Prior to joining UMMC, he held three major roles within Penn Medicine and the University of Pennsylvania Health System. He was the Gabriel Tucker Professor and Chair of the Department of Otorhinolaryngology – Head and Neck Surgery with joint appointments in the Departments of Neurosurgery, Radiation Oncology, the Abramson Cancer Center, and the School of Dental Medicine. As a health system executive, Dr. O'Malley served as Vice President of the University of Pennsylvania Health System, and Director of the Penn Specialty Network. In Penn Medicine's overarching physician and practitioner organization, Dr. O'Malley served as the Physician Executive of Penn Specialty Practices.

Dr. O'Malley began his academic faculty career at Johns Hopkins University in 1995 where he rose to Associate Professor and Director of Gene and Molecular Therapy in the Department of Otolaryngology – Head & Neck Surgery. Subsequent to his tenure at Hopkins, Dr. O'Malley served as Professor of Surgery and Chief of Otolaryngology – Head and Neck Surgery at the University of Maryland from 1999 to 2003 as well as Associate Director of the Greenebaum Cancer Center before he joined the University of Pennsylvania in 2003.

Dr. O'Malley is an internationally renowned surgeon and innovator with extensive clinical expertise in the area of skull base surgery, robotic surgery, and head and neck cancer. He is the co-inventor and developer of a series of novel robotic surgical procedures called TransOral Robotic Surgery (TORS). Dr. O'Malley co-founded the first human robotics head and neck surgery as well as skull base surgery program in the world and was Co-PI of the first IRB approved human clinical trial for robotic surgery in his specialty. In addition, he served as the Co-PI of the clinical trials that led to USFDA approval for TORS procedures in 2009 and 2014.

Dr. O'Malley has served as PI on three NIH RO1s and an R29 (FIRST) AWARD as well as numerous industry and foundation grants that focused on molecular therapy and molecular markers for cancer. He has also been a co-investigatory in numerous R01 and foundation grants and currently is a R01 co-investigator. He is a pioneer in the discovery and application of molecular and gene therapies for the treatment of head and neck cancer. He is also investigating novel combinations of stem cells and biomatrices for tissue defect reconstruction and has served as the Co-PI of the NIH-funded Penn Multidisciplinary Consortium: Personalized Dental, Oral and Craniofacial Tissue Regeneration. His current project involves a combination of nanotechnology and molecular therapy for the prevention of cisplatin induced hearing loss in head and neck cancer patients.

2022 PROGRAM CO-CHAIRS



James Rocco, MD

After earning PhD and MD degrees from Mount Sinai School of Medicine in the NIH MSTP program, Dr. Rocco entered the Otolaryngology residency program at Johns Hopkins Hospital, combining his clinical training with research on head and neck cancer. In 1999 he joined the faculty of the Harvard Medical School, moving to the Massachusetts Eye and Ear Infirmary and the Massachusetts General Hospital, where he established both an active clinical practice and a NIH-funded research laboratory focused on identifying biomarkers of clinical outcome in head and neck squamous cell carcinoma. During this period he served at the Director of Head and Neck Research at both the MEEI and the MGH and held the Daniel Miller Chair of Head and Neck Research at Harvard Medical School.

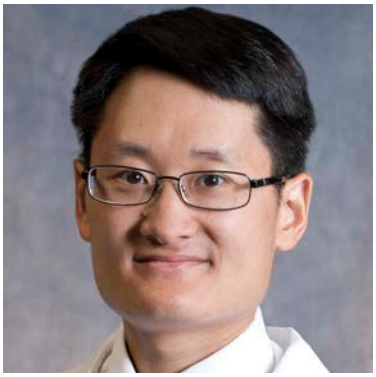
He was recruited to the James Cancer Hospital and Solove Research Institute at The Ohio State University in 2015 to serve in multiple roles—Director of the Division of Head and Neck Oncologic Surgery, Medical Director of the Head and Neck Service Line, and Director of the Head and Neck Disease Specific Research Group—while expanding his laboratory research and continuing to train future leaders in the field of Head and Neck Oncology. He holds the Mary E. and John W. Alford Chair of Research in Head and Neck Cancer.

In 2017 Dr. Rocco was named Chair of the Department of Otolaryngology – Head and Neck Surgery at Ohio State. In 2020 Dr. Rocco was asked to serve as interim Dean of the OSUWMC during the search process, a responsibility that concluded in September 2020 after nine months and the appointment of the new Dean.

Dr. Rocco leads an active R01-funded research effort that is focused on identifying biomarkers of clinical outcome in head and neck squamous cell carcinoma and was the Principal Investigator of an NCI trial targeting blood vessel growth in patients with recurrent or metastatic head and neck disease. He also oversees the creation of a tissue CORE to produce cells lines and PDX models for translational studies within the OSUWMC. Nationally, he has served in many specialty organizations, advisory boards, grant review panels, editorial boards, and national clinical panels including the AJCC, NCCN, and NRG. In this capacity he served as a special clinical expert to the NCI steering committee, the College of American Pathologist's task force on HPV testing standards, and the ASTRO task force on Oropharyngeal cancer therapeutic guidelines. Dr. Rocco was also recently selected to serve on the Joint Scientific Advisory Committee (JSAC) for the Stand Up To Cancer (SU2C) - Head and Neck Cancer Research Team Grant Program, a focused effort to bring new approaches to treating head and neck cancer into the clinical setting.

Dr. Rocco been an active participant within the AHNS over the last twenty odd years in many capacities including serving as the program chair for 2019 AACR-AHNS Head and Neck Conference "Optimizing Survival and Quality of Life through Basic, Clinical, and Translational Research", program chair for the 2022 AHNS Annual Meeting at COSM "Technology and Innovation" Chair of the AHNS Research Committee (second term), AHNS representative to the AJCC, AHNS representative to SU2C, as well as an AHNS foundation and executive board member.

Dr. Rocco currently serves on the NRG Head and Neck Core Committee, the NCCN Head and Neck Guidelines panel and was recently elected to a second term as Co-Chair of the NCI's Head and Neck Recurrent and Metastatic Disease task force. Dr. Rocco has served on several editorial boards including JCO, Head and Neck, Oral Oncology and Annals of Surgical Oncology and is now an Associate Editor for the journals Head and Neck and Oral Oncology. He has published numerous peer-reviewed scientific and clinical manuscripts and has been interviewed extensively by the scientific and lay press regarding head and neck cancer on numerous occasions, including interviews for Forbes magazine, the Wall Street Journal, Nature and the Proceedings of the National Academy of Sciences.



Jeffrey Liu, MD

Jeffrey C. Liu, MD FACS is an Associate Professor of Otolaryngology-Head and Neck Surgery at the Lewis Katz School of Medicine at Temple University and Fox Chase Cancer Center. He obtained his medical degree at Weill Cornell Medical College. He then completed a surgical internship at Columbia Presbyterian Medical Center, and his residency in Otolaryngology at New York Presbyterian Hospital - Columbia and Cornell Campuses. After residency he completed a fellowship in Head and Neck Oncologic Surgery at Memorial Sloan Kettering Cancer Center. He currently cares for head and neck cancer patients throughout Philadelphia at both the Temple and Fox Chase campuses. His current research interests include translational approaches to understanding racial disparities in head and neck cancer.

HAYES MARTIN LECTURER & PRESIDENTIAL CITATION

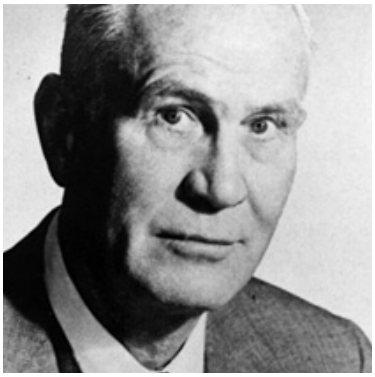
Gregory Weinstein, MD

Dr. Weinstein has been faculty at the University of Pennsylvania since 1991 and is Professor and Vice Chair of the Department of Otorhinolaryngology: Head and Neck Surgery. He is also the founding member and Director of the Penn Center for Head and Neck Cancer, which is an internationally renowned multidisciplinary team for the management of all aspects of care of patients with head and neck cancers. He is also the Director of the Head and Neck Cancer Service Line of Penn Medicine. Dr. Weinstein is a graduate of the Otololaryngology- Head and Neck Surgery residency program at the University of Iowa. Following his residency he completed an American Head and Neck Society fellowship in Head and Neck Oncologic Surgery. Dr. Weinstein's clinical expertise is in the head and neck surgery including all aspects of cancer surgery of oral, pharyngeal, laryngeal and neck cancer as well as special expertise in thyroid and parotid surgery. Dr. Weinstein has an international reputation for expertise in organ preservation for cancers involving the larynx. Dr Weinstein was the first surgeon in the United States to perform the larynx preserving surgery, the Supracricoid Partial Laryngectomy (SCPL). Dr. Weinstein has been the primary instructor of this procedure nationally and has recently published on the largest American series of this procedure. Dr. Weinstein, together with Dr. Bert W. O'Malley, Jr. established the world's first research program in TransOral Robotic Surgery (TORS). Through a multi-tiered translational research program, beginning in the laboratory with airway mannequins, and progressing through cadaver and animal models, numerous novel head and neck and skull base procedures were invented utilizing the da Vinci surgical system. Dr. Weinstein was Principle Investigator for the world's first Institutional Review Board approved human trial in TORS. TORS utilizes the da Vinci surgical system to resect benign and malignant lesions of the oral cavity, pharynx, larynx and skull base. Approximately 2000 patients have undergone TORS at the University of Pennsylvania, to date. Prior to FDA clearance for use of TORS in the United States Drs. Weinstein and O'Malley established the International TORS training program in which participants attend a clinical observership, cadaver and porcine laboratory at the University of Pennsylvania. This program has resulted in the establishment of active TORS clinical programs in numerous countries including Belgium, France, Italy, Brazil, Korea, Hong Kong, the United Kingdom, Japan, Singapore, Spain, Germany, Denmark, The Czech Republic, Turkey as well as others. Following FDA clearance the training program at the University of Pennsylvania was expanded to include American surgeons. To date approximately 450 Head and Neck Surgeons have participated in the TORS training program at the TORS cadaver lab at the University of Pennsylvania. His important work in the area of voice box preservation in the face of laryngeal cancer and TORS resulting in his being honored, on two separate occasions, with The University of Pennsylvania Health System Award of Excellence Luigi Mastroianni Clinical Innovator Award. Dr Weinstein is the author of over 150 peer reviewed medical articles. His books entitled Organ Preservation Surgery for Laryngeal Cancer and Transoral Robotic Surgery provide comprehensive and practical guides for clinicians in each of these surgical areas. Dr. Weinstein was a founding member and the first president of the Society of Robotic Surgeons. He has been Principal or Co-Principal investigator on multiple research grants. Dr Weinstein has given over 120 invited international and national lectures.

Past Hayes Martin Lecturers

Admiral William H. McRaven (2019)
Adalsteinn D. Brown, PhD (2018)
Mark K. Wax, MD (2017)
Ashok R. Shaha, MD (2016)
John A. Ridge, MD, PhD (2015)
Patrick J. Gullane, MD (2014)
Jonas T. Johnson, MD (2013)
Gregory T. Wolf, MD (2012)
Randal S. Weber, MD (2011)
Adel El-Naggar, MD (2010)
Charles W. Cummings, MD (2009)
Waun Ki Hong, MD (2008)
Jesus E. Medina, MD (2007)
Keith S. Heller, MD (2006)
Richard K. Reznick, MD, MEd (2005)
Christopher J. O'Brien, MD (2004)
Michael Johns, MD (2003)
Eugene Myers, MD (2002)
William Wei, MS (2001)
Robert M. Byers, MD (2000)
Jean-Louis H. LeFebvre, MD (1999)
Jatin P. Shah, MD (1998)
Blake Cady, MD (1997)
Joseph N. Attie, MD (1996)
Helmuth Goepfert, MD (1995)
John G. Batsakis, MD (1994)
Ronald H. Spiro, MD (1993)
John M. Lore, MD (1992)
Ian Thomas Jackson, MD (1991)
Alando J. Ballantyne, MD (1990)
George A. Sisson, MD (1989)
M.J. Jurkiewicz, MD (1988)
Elliot W. Strong, MD (1987)
Donald P. Shedd, MD (1986)
Alfred S. Ketcham, MD (1985)
William A. Maddox, MD (1984)
John J. Conley, MD (1983)
Milton Edgerton, MD (1982)
Richard H. Jesse, MD 1981)
Condict Moore, MD (1980)
Edward F. Scanlon, MD (1979)
Harvey W. Baker, MD (1978)
Harry W. Southwick, MD (1977)
Edgar L. Frazell, MD (1976)
Charles C. Harrold, MD (1975)
Arthur G. James, MD (1974)
Oliver H. Beahrs, MD (1973)
William S. MacComb, MD (1972)

HAYES MARTIN BIOGRAPHY



Hayes Martin, MD

Hayes Martin was born in Dayton, a small town in north central Iowa. He attended the University of Iowa at Iowa Falls before being accepted to the medical school in 1913 on the same campus, finishing 4 years later in a class of 20.

World War I began in April 1917 while Hayes was in his final year of medical school. Many of his classmates at the medical school were in the Army ROTC units; however, Dr. Martin opted for the Navy, which he joined on the day America entered the war. He traveled to Europe on the USS Arkansas and was assigned to his permanent duty station at the U.S. Navy Air Station, La Trinite Sur Mer, France – a small seaside village on the southern coast of Brittany. The purpose of this base was antisubmarine warfare using blimps and kite balloons. Dr. Martin was made commanding officer of the air station for a brief period of time when the line officer in charge had become ill; it was a unique position for a medical officer in the Navy to take command during wartime.

After the war, Dr. Martin returned to the U.S and sought out an internship at the old Poly Clinic Hospital in New York City, which was temporarily made into a Veteran's Administration hospital. Part of his internship was spent at Bellevue in the fourth surgical division, where he felt he would have the best possible training in general surgery. The chief of the second division was John A. Hartwell, MD, the distinguished surgeon memorialized by the Fellow's Room in the library of the New York Academy of Medicine. Dr. Hartwell suggested that Dr. Martin go to Memorial Hospital to learn about cancer.

Dr. Martin received an internship at Memorial in the summer of 1922 and stayed on as a resident until 1923. He then had two years at the second surgical service at Bellevue, where he operated to his heart's content and got the surgical education he so strongly desired. Once he finished his residency, Dr. Martin returned to Memorial where he joined as clinical assistant surgeon on the staff.

Dr. Martin made the use of aspiration biopsy on all solid tumors popular throughout Memorial. Now, this procedure is done throughout the world. Dr. Martin co-authored the first report on the subject published in the Annals of Surgery. Numerous other articles followed, including Dr. Martin's two most famous publications, "Cancer of the Head and Neck," published in two issues of the Journal of the American Medical Association in 1948, and "Neck Dissection," appearing in Cancer in 1951. These two papers were so extensively requested that the American Cancer Society made reprints by the thousands available to those who requested them as many as 20 years after publication. Dr. Martin's bibliography encompasses more than 160 articles.

In 1934, Dr. Martin was appointed Chief of the Head and Neck Service at Memorial Hospital. It wasn't until 1940 that surgery began to take over as the treatment of choice for the majority of cancers of the head and neck. In that year, the beginnings of improved anesthesia permitted advances in surgery. Later, during World War II, antibiotics became available and surgery began to dominate much of head and neck cancer management. Dr. Martin wrote extensively on many subjects, most within the realm of head and neck surgery. His ideal was to be the complete head and neck surgeon and he treated a wide variety of head and neck abnormalities. His book, Surgery of the Head and Neck Tumors, was published in 1957.

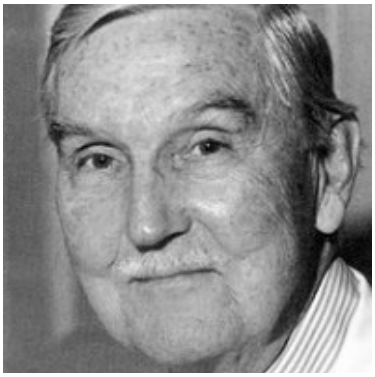
Dr. Martin retired from active practice in 1957 at the age of 65. He performed his last operation at Memorial Hospital, assisted by Dr. Elliot Strong, in October 1959, but continued to see patients in his office until he passed away in 1977.

JOHN J. CONLEY LECTURE

Robert Ferris, MD

Robert L. Ferris, MD, PhD is Hillman Professor of Oncology and Director of the UPMC Hillman Cancer Center, Associate Vice Chancellor for Cancer Research, and Professor of Otolaryngology, of Immunology, and of Radiation Oncology. Dr. Ferris currently serves on the Editorial Boards of JNCI, JCO, Clinical Cancer Research, Cancer Immunology Research and is Editor in Chief of Oral Oncology. Dr. Ferris has published over 400 peer-reviewed manuscripts and book chapters. Dr. Ferris's publications have been cited over 36,000 times producing an h-index of 96. He served as co-chair of the NCI Head and Neck Steering Committee until 2021 to facilitate prospective clinical trials and also chaired the NIH Tumor Microenvironment Study Section. Dr. Ferris's NIH-funded laboratory is focused on reversal of immune escape and immunotherapy using monoclonal antibodies and vaccines. He is lead investigator of practice-changing, prospective randomized trials, including Checkmate-141 which led to the FDA approval of nivolumab for recurrent or metastatic head and neck cancer, ECOG 3311, testing radiation and chemotherapy deintensification after transoral robotic surgery (TORS) for HPV+ oropharynx cancer, as well as ECOG-ACRIN 3132, using p53 mutational testing in HPV-negative cancer, to predict response to radiation versus chemoradiation. He leads the Pittsburgh Specialized Program of Research Excellence (SPORE) grant for translational head and neck research funded by the National Cancer Institute. In 2020 Dr. Ferris led the Hillman Cancer Center through its NCI renewal, receiving the highest possible "Exceptional" rating.

JOHN J. CONLEY BIOGRAPHY



Although he looked and sounded like an English nobleman, Dr. John Conley was born in Carnegie, Pennsylvania, a small steel mill town just outside of Pittsburgh. He graduated from the University of Pittsburgh and later its school of medicine. He interned at Mercy Hospital in Pittsburgh. During that year, the nuns who ran the hospital suggested that Dr. Conley take a residency in cardiology and come back to Mercy as their cardiologist.

He went to Kings County Hospital in Brooklyn, a very busy city hospital with a huge patient population. Shortly after he began his training, he had an arrhythmia diagnosed as paroxysmal atrial tachycardia. Little was known about this benign condition at that time. Dr. Conley was told that cardiology was too stressful and that he should go into an easier, less-stressful field with better working hours, like ENT. He did an otolaryngology residency at Kings County Hospital. This was followed by four years of military service during World War II, which included experience in otolaryngology and plastic and reconstructive and maxillofacial surgery in the U.S. Army Medical Corps, both in this country and in the South Pacific theater. Exposure to the construction of war wounds would prove invaluable to him later on in applying these principles to reconstruction following ablative head and neck surgery.

Dr. Conley returned to New York City after the war. He became an assistant and then an associate of Dr. George T. Pack, a technically superb general oncologic surgeon at Memorial Hospital who taught Dr. Conley major ablative surgery of the head and neck. They worked day and night catching up with the backlog of surgery that was neglected during the war years. The combination of his training in otolaryngology, the exposure to ablative surgery, and the World War II experience in reconstructive surgery set the stage for Dr. Conley to evolve his unique approach to head and neck surgery.

Ironically, despite the admonition of the cardiologists about hard work, Dr. Conley did a prodigious amount of major head and neck reconstructive surgery. This proved to be more than ample to provide training to many fellows. His commitment to education is further attested to by the position he held for many years as Clinical Professor of Otolaryngology at the College of Physicians and Surgeons at Columbia University. He loved his appointment at Columbia and particularly his involvement in teaching the residents.

Dr. Conley's vast surgical experience, together with active research interests, led to the authorship of almost 300 contributions to the scientific literature, and eight books. As a result of his productivity and rhetorical eloquence, he was very much in demand as a speaker in this country and abroad. He gave many prestigious eponymous lectures in our field and received many awards for his work, including the Philip H. Hench Award as the Distinguished Alumnus of the University of Pittsburgh School of Medicine, and the DeRoaldes and Newcomb Awards of the American Laryngological Association.

Dr. Conley's contributions to the scientific literature, many technical innovations and surgical experience placed him in the position to receive many honors and important leadership positions, such as President of the American Academy of Otolaryngology and Ophthalmology, member of the Board of Governors of the American College of Surgeons, founding member of the Society of Head and Neck Surgeons, and founding member and first President of the American Society for Head and Neck Surgery. During those years, Dr. Conley used, to the great benefit of us all, his wisdom and diplomacy in carrying out such high-level responsibilities.

Past John J. Conley Lecturers

Michael Porter, MBA, PhD (2019)
Brian O'Sullivan, MD, FRCPC, FRCPI, FASTRO (2018)
Johannes Fagan, MBChB, MMed, FCORL (2017)
Robert S. Bell, CM, MSc, MD, FRCSC (2016)
Jonathan Irish, MD, MSc, FRCSC (2015)
Antonio Fojo, MD, PhD (2014)
Patrick J. Gullane, MB, FRCSC, FRACS (2013)
Julie A. Freischlag, MD (2012)
Benjamin S. Carson, Sr., MD (2011)
Robert L. Comis, MD (2010)
James D. Smith, MD (2009)
Carolyn Dresler, MD (2008)
Kenneth I. Shine, MD (2007)
John Stone, MD, MACP (2006)
James F. Battey Jr., MD (2005)
David C. Leach, MD (2004)
Jonathan D. Moreno, MD (2003)
Rabbi David Saperstein (2002)
Edward Hughes, MD (2001)

DISTINGUISHED KEYNOTE LECTURE

Bert W. O'Malley, MD

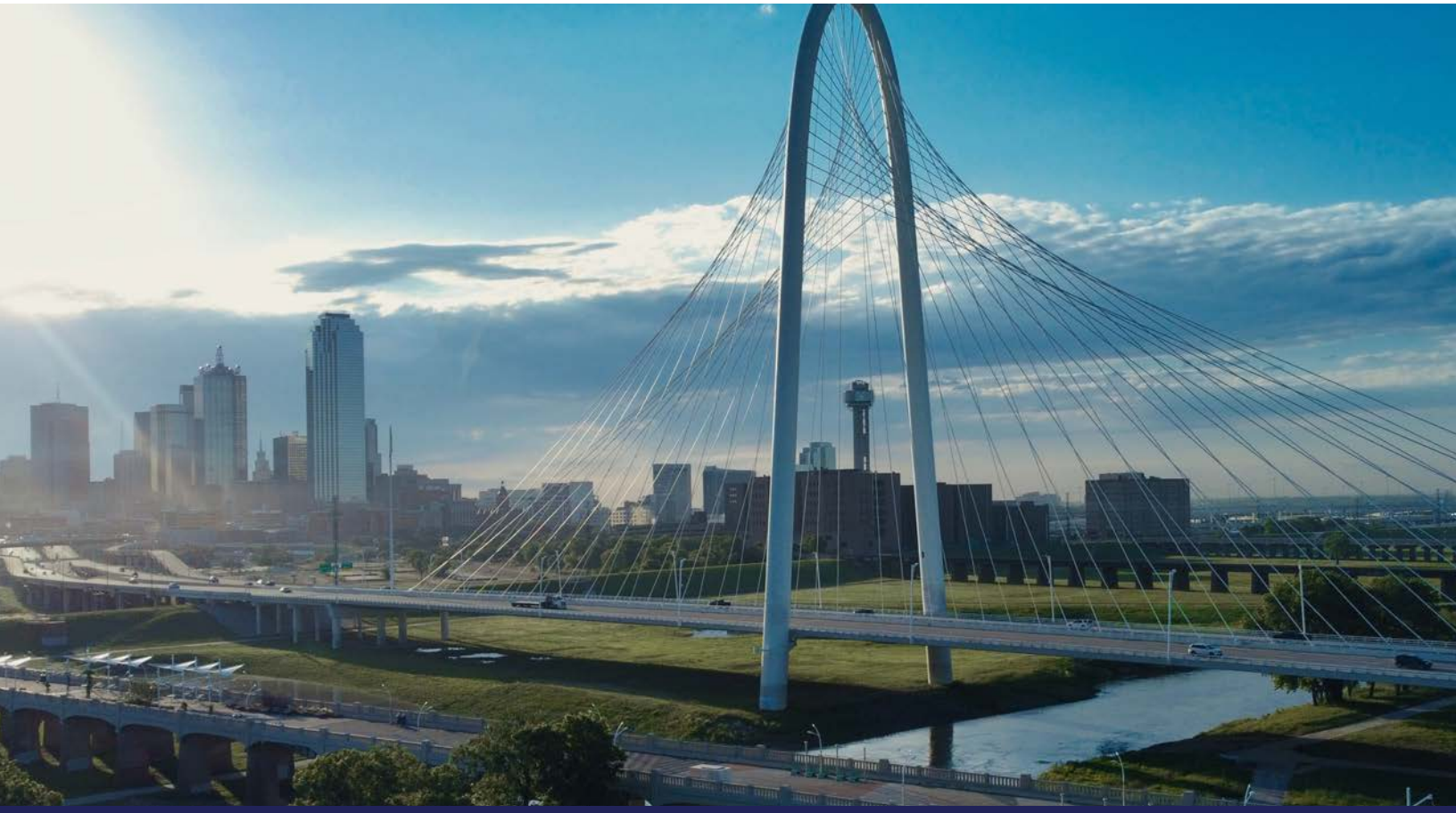
Dr. Bert O'Malley is the Tom Thompson Distinguished Leadership Professor of Molecular and Cellular Biology and Chancellor at Baylor College of Medicine. He graduated medical school at U. Pittsburgh, followed by periods at Duke for medical residency, NIH for research training, and Vanderbilt as Director of the Reproductive Research Center. He relocated to Baylor College of Medicine in 1972 as Chair of Molecular and Cellular Biology and assumed the Chancellorship in 2019.

Scientific Career

He was first to discover that nuclear receptors are transcription factors that regulate mRNA production in target cells in response to intracellular hormones. He uncovered mechanisms for activating steroid receptors, and discovered the existence of 'coregulators' - the coactivators and corepressors of NR-dependent gene transcription. The coregulators turned out to be the long sought 'master regulators' of the entirety of mammalian gene function. His work led to a molecular understanding of how hormonal antagonists/SERMs work and revealed the major importance of coactivators to diseases of reproduction, genetics, metabolism, cardiovascular function, and especially cancers. His recent publications of the first Cryo-EM structures of a NR/SRC/p300 complexes on DNA represent a major achievement in the field. He also discovered that coactivators can be drugged using small molecules.

Dr. O'Malley is the founding father of the field of Molecular Endocrinology and a member of the 'National Academies of: 'Sciences'; and of 'Medicine'; and of 'Inventors'. He has received over 65 honors and awards for his work, including the National Medal of Science (White House, 2008). He has trained over 220 scientists and published over 750 papers and holds 29 patents in the fields of Gene Regulation, Molecular Endocrinology and Steroid Receptor, Coactivator Action and Molecular Drug Therapies.

His current interest lies in the impressive cooperation of nuclear coactivator proteins in dysfunctional processes of transcription in cancer, metabolic disease, and heart and kidney damage. This interest was fueled by his many studies of structure/function of mammalian coregulator complexes and their crossover roles in transcription, disease and tissue repair. He discovered the concept that small molecules can regulate coactivators to produce therapeutic outcomes for diseases such as cancer and heart and kidney failures. Recently, he discovered a new therapy for cancers that will be discussed today.



JATIN P. SHAH SYMPOSIUM: DIAGNOSTIC AND THERAPEUTIC ADVANCES IN HPV-RELATED OROPHARYNGEAL CANCER

Thursday, April 28, 2022 | 10:15 AM - 12:00 PM | Landmark B

A panel of experts will highlight the pros and cons of two remote access approaches versus a traditional "open" transcervical approach for thyroidectomy.

Moderator: Amy Chen, MD, MPH | Debaters: Michael Singer, MD; Yoon Woo Koh, MD, PhD; and Jonathon Russell, MD

JATIN P. SHAH BIOGRAPHY

Professor Jatin P. Shah graduated from the Medical College of Maharaja Sayajirao University in Baroda, India, where he received his basic training in General Surgery. He completed a Fellowship in Surgical Oncology and Head and Neck Surgery at Memorial Sloan Kettering Cancer Center, (MSKCC) and joined its full-time faculty in 1975.He was Chief of the Head and Neck Service and Leader of the Head and Neck Disease Management Team at MSKCC for 23 years. He is Professor of Surgery at the Weil Medical College of Cornell University and holds The Elliott W. Strong Chair in Head and Neck Oncology at Memorial Sloan-Kettering Cancer Center in New York City.

Dr Shah is a national and international leader in the field of Head and Neck Surgery, having served as President of The New York Cancer Society, The New York Head and Neck Society, The Society of Head and Neck Surgeons, The North American Skull Base Society and the International Academy of Oral Oncology. He is Founder of The International Federation of Head and Neck Oncologic Societies, (IFHNOS) and serves as it's Chief Executive Officer (CEO) . He was Chairman of the AJCC task force on Head and Neck for 20 years, and serves on the Head and Neck and Thyroid committees of the NCCN. He has served in varying capacities for The American Board of Surgery and The American College of Surgeons.

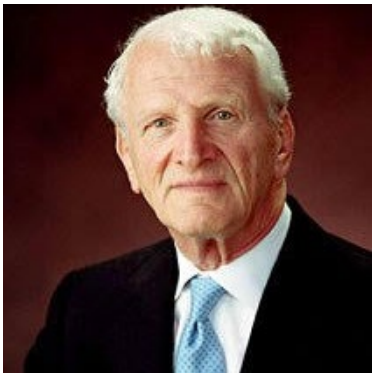
Professor Shah has been the recipient of numerous awards from various parts of the world, including Honorary Fellowships and Doctorates from the UK, Scotland, Ireland, Belgium, Greece, Australia and India. He is the recipient of the Blokhin Gold medal, and Pirogov Medal from Russia, the Gunnar Holmgren medal from Sweden, and the "Ellis Island Medal of Honor" from the United States. He was named the Most Distinguished Physician in the USA by the American Association of Physicians from India in 2011, and received the Life Time Achievement award from the Global Association of Physicians of Indian Origin. He has been listed in the "Best Doctors in America" directories 60 times for the past two decades. Dr. Shah is also an honorary member of several head and neck societies in Europe, Asia, Australia, Africa and South America.

He serves on the Editorial and Review Boards of 18 scientific journals and has published over 650 peer-reviewed articles, which have been cited over 60,000 times according to Google scholar. His h index is 142. In addition he has published, 73 book chapters and 14 books. His textbook of Head and Neck Surgery and Oncology, now in its 5th Edition, has won numerous prizes for the best published book in Otolaryngology-Head and Neck Surgery. He developed and lead the "IFHNOS World Tour Program", a global CME program in Head and Neck Surgery and Oncology, offered in 26 countries over the last six years. He has established the Global On Line Fellowship (GOLF) program in Head and Neck Surgery and oncology in collaboration with IFHNOS and MSKCC, and has also initiated an International fellowship program in Clinical surgery at various head and neck centers around the world.

As a physician, scientist and educator , Dr. Shah is a much sought after speaker who has delivered over 1,800 scientific presentations including, 80 eponymous lectures and keynote addresses, and visiting professorships in the United States, Canada, United Kingdom, Scotland, Sweden, Belgium, Netherlands, Germany, Italy, Spain, Poland, Czech Republic, Estonia, Russia, Ukraine, Belarus, Armenia, Croatia, Albania, Romania, Greece, Turkey, Egypt, UAE, Saudi Arabia, South Africa, India, Pakistan, China, South Korea, Japan, Hong Kong, Taiwan, Singapore, Malaysia, Thailand, Indonesia, Philippines, Australia, New Zealand, Argentina, Brazil, Chile, Peru, Ecuador, Colombia, Venezuela, Panama, and Mexico.

In recognition of his outstanding contributions and international leadership in Head and Neck Surgery, Memorial Sloan Kettering Cancer Center, has established The "Jatin Shah Chair in Head and Neck Surgery and Oncology" and the "Jatin Shah Annual Lectureship". The International Federation of Head and Neck Oncologic Societies has established "The Jatin Shah Lecture" at its world congresses, and the American Head and Neck Society has established the "Jatin Shah Symposium" at its annual meeting.

GUEST OF HONOR & PRESIDENTIAL CITATION



Eugene N. Myers, MD, FACS, FRCS Edin. (Hon)

Eugene N. Myers MD, FACS, FRCS Edin(Hon) comes from a long line of physicians including his Grandfather, his Father and three Uncles. HIs Father, David, was the Chairman of the Department of Otorhinology in the Temple University School of Medicine. His son, Jeffrey, is the Alando Ballantyne Professor and Chairman of the department of Head and Neck Surgery at the MD Anderson Cancer Center and the University of Texas. His grandson, Keith, recently graduated with an MD from Temple University School of Medicine.

Dr. Myers received a B.S in Economics from the Wharton School of the University of Pennsylvania and his M.D. degree from Temple University School of Medicine. He did his internship at Mt. Sinai School of Medicine in New York City followed by a residency in Otolaryngology at the Massachusetts Eye and Ear Infirmary/ Harvard Medical School. This was followed by military service as a Captain in the U.S. Army stationed as an otolaryngologist in the 97th General Hospital in Frankfurt, Germany. He then served as a Special Fellow in Head and Neck Surgery with Dr. John Conley in New York City.

Dr. Myers was appointed Chairman of the Department of Otolaryngology in the University of Pittsburgh School of Medicine in 1972 and under his leadership transformed it into a world-renowned Department. He estimates that he did 9,000 operations during the 33 years as Chairman. He has made many contributions including the development and implementation of the treatment method to properly manage patients who have extracapsular spread of cancer in their cervical lymph nodes and introduced the technique of skull base surgery.

Dr. Myers academic achievements include the publication of more than 300 peer reviewed articles, 20 textbooks, including the popular Cancer of the Head and Neck and Operative Otolaryngology-Head and Neck Surgery, and 150 book chapters. He has delivered more than 750 lectures, including 48 eponymous lectures, and participated in numerous panels and round tables.

Dr. Myers served as President of the American Board of Otolaryngology, the American Academy of Otolaryngology-Head and Neck Surgery, the American Society of Head and Neck Surgery, the American Laryngological Association, and the Pan American Association of Otolaryngology-Head and Neck Surgery. He was the founder of the International Department of the American Academy of Otolaryngology-Head and Neck Surgery and organized a worldwide network of National Societies. He is an Honorary Member of the National Society of 20 countries and is a member of the Editorial Board of the journal of many national societies.

Dr. Myers remains deeply involved in International affairs including membership in the International Steering Committee of our Academy. He is President of the Board of Directors of Pittsburgh Festival Opera and a member of the Board of Directors of the Eye and Ear Foundation and SPOHNC (Support for Persons with Oral and Head and Neck Cancer).

Dr. Myers and his wife Barbara have been married for 65years. They have a daughter Marjorie who is an Executive Recruiter and a son Jeffrey who is the Alando Ballantyne Professor and Chairman of the Department of Head and Neck Surgery in the MD Anderson Center and 5 overachieving Grandsons all of whom he loves very much.

DISTINGUISHED SERVICE AWARD

Paul Friedlander, MD

Dr. Paul Friedlander completed an Otolaryngology Residency at Louisiana State University in New Orleans in 1995. He then completed a head and neck surgical oncology fellowship at Memorial Sloan Kettering Cancer Center in 1997. He currently is the Chairman of the Department of Otolaryngology at Tulane University School of Medicine in New Orleans, LA. He is the founder of "Healing Hands Across the Divide" - a faith and community based partnership based in New Orleans whose mission is identification and eradication of health care disparity. Current research interests include: health care delivery for underserved populations with a focus on early detection and effective management of head and neck cancer. He is proud to serve as the Chairman of the Continuing Medical Education Committee for the American Head and Neck Society.

Past Distinguished Service Award Recipients

Jatin P. Shah, MD 1989
Stephan Ariyan, MD 1990
Ashok R. Shaha, MD 1991
Elliot W. Strong, MD 1995
John J. Coleman, III MD 1999
David L. Larson, MD 1999
Harold J. Wanebo, MD 1999
Jonas T. Johnson, MD 2001
Helmuth Goepfert, MD 2003
Marc D. Coltrera, MD 2004
Wayne Koch, MD 2005
John A. Ridge, MD, PhD 2006
Ernest A. Weymuller, Jr., MD 2007
Helmuth Goepfert, MD 2008
Keith S. Heller, MD 2009
Mark K. Wax, MD 2010
Randal S. Weber 2011
Ashok R. Shaha, MD 2012
Dennis H. Kraus, MD 2013
Jesus E. Medina, MD 2014
Carol R. Bradford, MD 2015
Ehab Hanna, MD 2016
Dennis H. Kraus, MD 2017
Brian P. Burkey, MD, MEd 2018
William Lydiatt, MD 2019

Past Special Recognition Award Recipients

Paul B. Chretien, MD 1984
John M. Lore, Jr., MD 1985
William S. MacComb, MD 1986
Calvin T. Klopp, MD 1987
Edgar L. Fazell, MD 1988
Harvey W. Baker, MD 1989
Vahram Y. Bakamjian, MD 1991
Jean-Louis Lefevbre, MD 1995

PRESIDENTIAL CITATIONS

Fred Ledley, MD

Fred D. Ledley, MD, is Director of the Center for Integration of Science and Industry at Bentley University, a Professor in the Department of Natural & Applied Sciences and Department of Management, and Member of Bentley's Health Thought Leadership Network. A recognized opinion leader in biomedical science and innovation, he has authored >200 publications in fields ranging from molecular human genetics, gene therapy, and clinical development to biotechnology business and finance, economics, and public policy. Ledley has served on the faculties of the Howard Hughes Medical Institute, Baylor College of Medicine, and Texas Children's Hospital and was involved in founding biotechnology companies focused on gene therapy and personalized medicine, serving in roles from Vice President, research & development to President & CEO. His current research focuses on advancing the translation of scientific discoveries for public value with a particular focus on the role of basic and applied biomedical science, public and private sector investments in pharmaceutical innovation and their returns, and assessing both the health value and the profits generated by these innovations. His work has contributed to policy discussions regarding NIH funding, drug pricing, and health equity. He has a BS from the University of Maryland, an MD from Georgetown University School of Medicine, trained in pediatrics and genetics at Boston Children's Hospital and Harvard Medical School and was an American Cancer Society post-doctoral fellow with Dr. David Baltimore at the Massachusetts Institute of Technology.

Daqing Li, MD

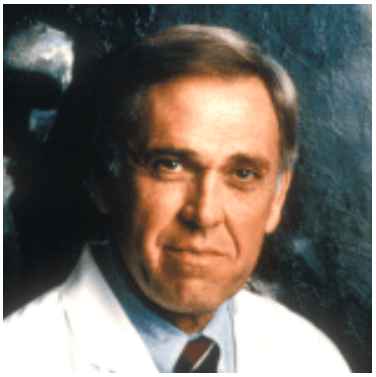
Daqing Li, MD, is a physician scientist and serves as professor and attending physician within the Department of Otorhinolaryngology, Head and Neck Surgery at Penn Medicine. He has devoted his career to our specialty of Otorhinolaryngology, Head and Neck Surgery for more than 30 years.

Dr. Li's clinical expertise is within otology and neurotology and he has an active practice at Penn Medicine. His translational research laboratory focuses on molecular therapies and consists of two main arms of investigation. One arm focuses on head and neck oncology and the other focuses on auditory neuroscience. Dr. Li and his research team developed a molecular approach to convert cisplatin-resistant head and neck cancer cells to a cisplatin-sensitive phenotype, which may reduce the need for toxic doses of cisplatin used clinically. In addition, his research team has developed a novel nanohydrogel and inner ear targeted delivery system that holds potential developing molecular therapies to treat a broad range of inner ear and hearing disorders.

As stated by The American Head and Neck Society (AHNS), survivorship continues to develop into a distinct focus area within head and neck oncology. Hearing loss occurs in a lot of head and neck cancer survivors. Platinum-based chemotherapy is a major factor causing ototoxicity with permanent hearing loss which results in neurocognitive deficits, behavioral problems and poor quality of life. There is no effective medical intervention for this type of hearing loss at this time. By combining his broad clinical and research experience, Dr. Li is leading a multidisciplinary team to develop a novel inner ear nano-dialysis system for the prevention and treatment of chemo-induced ototoxicity and hearing loss. His current research is fully funded by the NIH, and initial promising results generate a great interest from the Office of Cancer Survivorship, National Cancer Institute and cancer survivors.

Dr. Li has been a Principal Investigator on many research projects and grants from different funding agents including National Institute of Health (NIH). Dr. Li is also an AUD-Ad-Hoc Reviewer for the National Institute of Deafness and other Communication Disorders (NIDCD). He has published more than 200 peer-reviewed articles and abstracts, and he has received numerous awards including the Honor Award from the American Academy of Otolaryngology, Head and Neck Surgery. Dr. Li serves as Editor-in-Chief and as editorial board members in our international professional journals. Dr. Li is a fellow of American Academy of Otolaryngology, Head and Neck Surgery and American Neurotology Society.

PRESIDENTIAL CITATIONS



Bobby Alford, MD

Dr. Bobby R. Alford's dedication to the specialty of otolaryngology is evidenced by his accomplishments in patient care, education, and research at the department named in his honor at Baylor College of Medicine.

His commitment to education and the training of otolaryngologists has led to an amazing legacy. Since 1962, the department that was chaired by Dr. Alford from 1967 to 2010, has trained more than 250 residents and fellows. Many have gone on to hold academic positions, including 30 who have become full professors and 16 who have become, or are currently, department chairs.

Dr. Alford believed strongly in the link between research and patient care, as well as the benefits of cooperation between the specialties of the neurosensory systems. He, therefore, played a significant role in the creation and development of the Neurosensory Center of Houston for The Methodist Hospital and Baylor College of Medicine, which opened in 1977. It was specifically established to promote the educational, research, and clinical objectives and needs of the clinical neurosciences. In this same vein, Dr. Alford also advocated for a close relationship between otolaryngology and audiology and encouraged joint research. Dr. Alford's own research endeavors resulted in the publication of more than 140 scientific papers, including seminal work in several areas of otolaryngology.

His efforts to encourage cross-disciplinary research also led to his involvement with U.S. space programs ultimately resulting in the formation of the National Space Biomedical Research Institute (NSBRI) established by NASA in 1997, of which he served as its initial CEO. He was the Chairman of the Board of Directors of the NSBRI. At the time, this consortium of 12 institutions led a national effort to conduct the biomedical research necessary to support long-term human presence, development, and exploration of space and to enhance life on Earth by applying the resulting advances in human knowledge and technology.

Candace Johnson, PhD

Dr. Candace S. Johnson joined the faculty of Roswell Park Comprehensive Cancer Center in February 2002, and is currently President & CEO, the M&T Bank Presidential Chair in Leadership and Professor of Oncology.

Prior to her appointment as Roswell Park President & CEO in 2015, Dr. Johnson was Deputy Director of the Center and also Chair of the Department of Pharmacology and Therapeutics for more than a decade. Her major responsibilities were to facilitate the seamless bench-to-bedside development and delivery of promising new cancer therapies involving various types of cancer.

From 1997-2002, Dr. Johnson served as Deputy Director of Basic Research at the University of Pittsburgh Cancer Institute, and Professor of Pharmacology and Medicine at the University of Pittsburgh School of Medicine.

Dr. Johnson earned her doctoral degree in Immunology from Ohio State University, Columbus, in 1977. From 1977 to 1981, she completed research and postdoctoral fellowships in Immunology/Cell Biology at the Michigan Cancer Foundation, Detroit. Her research interests include translational research to facilitate the efficient application of promising laboratory findings in clinical studies; preclinical design and development of more effective therapeutic approaches to cancer using highly characterized tumor models; and mechanisms of vitamin D mediated antiproliferative effects either alone or in combination with other cytotoxic agents.

Dr. Johnson is a member of the National Institutes of Health Reviewers Reserve and has served as a member of the National Cancer Institute Review Group Subcommittee A Cancer Center (Parent Committee) and of the Experimental Therapeutics Study Section for 2 terms. She also is a member of many professional and scientific societies, Senior Editor of Molecular Cancer Therapeutics, Associate Editor of Molecular and Cellular Differentiation, Oncology, and Molecular Pharmacology, and a member of the editorial board of Oncology Reports and Molecular Pharmacology. Since 2019, she has served on the NCI Frederick National Laboratory Advisory Committee.

Dr. Johnson has authored or coauthored nearly 200 journal publications, book chapters and abstracts, and has been issued patents on the "Use of Pretreatment Chemicals to Enhance Efficacy of Cytotoxic Agents" and "Endothelial Specific Targeting."

PRESIDENTIAL CITATIONS

Jonas T. Johnson, MD

Dr. Johnson has committed his life's work to the treatment of patients with diseases of the head and neck in an environment of education and inquiry. His current appointment is as Distinguished Service Professor and Chairman of the Department of Otolaryngology at the University of Pittsburgh School of Medicine. Dr. Johnson holds the Eugene N. Myers Chair in Otolaryngology. Dr. Johnson has limited his clinical practice to the treatment of patients with tumors of the head and neck. Most recently his work has focused on survivorship care for head and neck cancer survivors and the avoidance of low value interventions. He served as Editor of The Laryngoscope 2003-2011. Dr. Johnson is a Past President of the American Academy of Otolaryngology—Head and Neck Surgery (2003), the American Head and Neck Society (2004) and the Triologic Society (2014).

Robin L. Wagner, CMP, COPM

Robin L. Wagner is the Founder, President and Chief Executive Officer of Concepts Management Group (CMG), a full-service association management company based in Forest Hills, Pennsylvania. Under Robin's leadership, CMG has grown to provide staffing, expertise and resources to manage governance, operations, communications, education, certification, accounting and conference and event services for 15 professional associations across the United States.

Prior to founding CMG in 1996, Robin served in administrative management and research and education roles in the University of Pittsburgh's Department of Otolaryngology for nearly 25 years. She coauthored more than 80 otolaryngology peer-reviewed articles in medical literature, and she has presented to medical professionals across the country. During her otolaryngology career, Robin worked on more than 200 research studies while managing the educational meetings and special events for the department.

While at the University of Pittsburgh, Robin also provided administrative oversight of the American Society of Head and Neck Surgery and the American Head and Neck Society (AHNS) for eight years. In addition, she served as the Editorial Coordinator for the American Journal of Otolaryngology-Head and Neck Surgery for seven years as well.

Robin is a member of the American Society of Association Executives (ASAE) and the AMC Institute. She is a certified meeting professional (CMP) and the past president of Meeting Professionals International (MPI), Pittsburgh Chapter. Robin has been recognized by many organizations for her outstanding contributions to the field. She received a Presidential Citation from the AHNS in 2004 for her contributions to research and education in head and neck cancer; a Rising Star award and Planner of the Year award from MPI in 2002; and Leader of the Year from MPI in 2005. She has also received an award in 2005 from the Department of Otolaryngology at the University of Pittsburgh for Outstanding Contributions to Resident Education.

Robin received a Bachelor of Science degree in Biology from Westminster College in New Wilmington, Pennsylvania. She resides in Pittsburgh, Pennsylvania.

PRESIDENTIAL CITATIONS

Charles Cummings, MD

Charles Cummings was born in Boston, Massachusetts, in November of 1935. He graduated from Deerfield Academy in 1953, Dartmouth College in 1957, and the University of Virginia Medical School in 1961. He was an intern at Dartmouth and completed a year of general surgery residency at the University of Virginia. Dr. Cummings entered the Air Force in 1963, was discharged in July 1965, and entered residency training in Otolaryngology-Head and Neck Surgery at the Harvard Medical School, Massachusetts Eye and Ear Infirmary, finishing the program in 1968.

Dr. Cummings worked in private practice in Boston and on the clinical staff at the Massachusetts Eye and Ear Infirmary until the end of 1975 when he moved to Syracuse, New York and became an Associate Professor in the Department of Otolaryngology – Head and Neck Surgery at the State University of New York Upstate Medical University. Two years later, he assumed chairmanship of the Department of Otolaryngology – Head and Neck Surgery at the University of Washington where he remained until the end of 1990 when he became Director of the Department of Otolaryngology – Head and Neck Surgery at Johns Hopkins. . He was Chief of Staff of The Johns Hopkins Hospital from 1997 through 1999. In 2003, Dr. Cummings stepped down as Director. Dr. Cummings was also the Executive Medical Director for Johns Hopkins International from 2003 until 2011. In addition, he has served as interim chair of the Department of Dermatology (2007 - 2009) and the Department of Orthopaedics from (9/2011 - 9/2013) He returned to the Department of OTO/HNS at that time as Distinguished Service Professor of Otolaryngology/ Head and Neck Surgery and Oncology.

He has written 144 scientific papers and was the founder and Senior Editor of the four-volume text, Cummings Otolaryngology – Head and Neck Surgery, which is now in its seventh edition, edited by Dr Paul Flint He has also co-authored two surgical atlases, one on laryngeal surgery and another on surgical access and reconstruction in the field of laryngology and head and neck surgery. Dr. Cummings served as a Director of the American Board of Otolaryngology, as Chairman of the Residency Review Committee and Chairman of the Advisory Council for Otolaryngology to the American College of Surgeons. He is a Past President of the American Association for Academic Departments of Otolaryngology, American Broncho-Esophagological Association, the American Academy of Otolaryngology – Head and Neck Surgery and the American Society for Head and Neck Surgery. Dr. Cummings has received numerous honors for his work, including the Chevalier Jackson Award (American Broncho-Esophagological Association), the Newcomb Award (American Laryngological Association), the Ogura lecturer for the Triological Society, The Hayes Martin lecturer for the American Head and Neck Society, The Daniel Baker Lecturer for the Triological Society, and others. He was presented with the 2009 Johns Hopkins Heritage Award, and the Johns Hopkins Distinguished Alumnus award in 2013. He was the recipient of the Walter Reed Award from the University of Virginia in 2017.

He has been honored by many International Head and neck Societies as an honorary member..

Many of his former residents and faculty are currently in meaningful academic positions or Chairing Departments of Otolaryngology- Head and Neck Surgery at leading Academic Institutions, a source of great personal pride.

PRESIDENTIAL CITATIONS

Claudio Cernea, MD, PhD

Education:

1973-78 - Medical School – University of São Paulo School of Medicine (USPSM) – São Paulo, Brazil

1979-82 - Residency in General Surgery – Hospital das Clínicas - USPSM – São Paulo, Brazil

1982-83 - Fellowship in Head and Neck Surgery Surgery – Hospital das Clínicas - USPSM – São Paulo, Brazil

1984-90 - Doctoral Course - USPSM – São Paulo, Brazil

1991 - Doctoral Thesis - USPSM – São Paulo, Brazil – "Identification of the External Branch of the Superior Laryngeal Nerve in Thyroidectomy: an anatomical and surgical study" – approved Magnum Cum Lauda

2002 - Full Professorship Thesis - USPSM – São Paulo, Brazil – "Skin Carcinomas with Skull Base Invasion: a case-control study of clinical, histological and biological factors" – approved with 9.87 degree

Faculty Appointments:

1984-2001 - Assistant Professor of Head and Neck Surgery, USPSM – São Paulo, Brazil; Attending Surgeon – Service of Head and Neck Surgery – Hospital das Clínicas of the USPSM

2002 - Present - Full Professor of Surgery - USPSM – São Paulo, Brazil - Attending Surgeon – Service of Head and Neck Surgery – Hospital das Clínicas of the USPSM

2015 – 2019 - Chief – Service of Head and Neck Surgery – USPSM

Professional Activities:

1. Executive Council of Brazilian Society of Head and Neck Surgery from 1993 to 2003, serving as President from 2001 to 2003
2. Executive Council of the AHNS from 2001 to 2004
3. Executive Council of the IFHNOS from 2003 to 2006
4. Treasurer of the IFHNOS from 2014 to 2018
5. Director of the IFHNOS from 2018 to 2023

Communications in official Meetings and Congresses (both nationally and internationally): 235

Lectures and conferences (both nationally and internationally): 316

Bibliography includes (both nationally and internationally) 241 original articles, 5 books and 71 chapters and reviews.

Menthorship at the Department of Surgery of the USPSM

Doctoral thesis – 10 Orientations

Scientific Initiation (Graduation students) – 9 (2 ongoing)

Post-Doctoral thesis - 3

Visiting Professor/Featured Guest Speaker:

1990 – Free University – Amsterdam, Netherlands
1997 – University of Cordoba – Cordoba, Argentina
2000 – University of Pittsburgh School of Medicine – Pittsburgh, USA
2000 – Memorial Sloan-Kettering Cancer Center – New York, USA
2001 – Harvard School of Medicine – Boston, USA
2001 – University of Göttingen – Göttingen, Germany
2003 – University of Pittsburgh School of Medicine – Pittsburgh, USA
2003 – Center of Endocrine Surgery – St. Petersburg, Russia
2004 – Baylor College of Medicine – Dallas, USA
2005 – Albert Einstein College of Medicine – New York, USA
2005 – Harvard School of Medicine – Boston, USA
2006 – Ukranian Scientific & Practical Center of Endocrine Surgery – Kiev, Ukraine
2008 – MD Anderson Cancer Center – Houston, USA
2009 – University of Geneva – Geneva, Switzerland
2009 – University of Pennsylvania – Philadelphia, USA
2010 – Vittorio Veneto Hands-On Laryngeal Course – Vittorio Veneto, Italy
2011 – University of Varese – Varese, Italy
2011 – University of Hong Kong – Hong Kong, China
2012 – University of Varese – Varese, Italy
2012 – Harvard School of Medicine
2013 – Johns Hopkins Medical School

Web of Science – H-Index: 28

Scopus – H-Index: 29

Google Scholar – H-Index: 39

PRESIDENTIAL CITATIONS

Fernando Luis Dias, MD

Education:

1975 – 80 Medical School at Federal University of Rio de Janeiro / Rio de Janeiro – Brazil

1981 – 83 Residency in General Surgery at São Francisco de Paula Hospital – National Institute of Health – INAMPS / Rio de Janeiro – Brazil

1983 – 84 In Service training in Thoracic Surgery at Marcílio Dias Naval Hospital / Rio de Janeiro – Brazil

1984 – 87 Fellowship in Oncologic Surgery / Head and Neck Surgery at the Brazilian National Cancer Institute / Rio de Janeiro – Brazil

1991 – 95 Master of Science in General Surgery / Thoracic Surgery at Clementino Fraga Filho University Hospital / Federal University of Rio de Janeiro / Rio de Janeiro – Brazil

1996 – 99 PhD in Medicine at the Department of Head and Neck Surgery / Hospital das Clínicas – University of São Paulo School of Medicine / São Paulo – Brazil

Specialty Certification

1984 Brazilian Board of the Brazilian College of Surgeons - General Surgery

1986 Specialization in Head and Neck Surgery at the Catholic University of Rio de Janeiro

1987 Board of the Brazilian Medical Association – Oncologic Surgery

1995 Brazilian Board of the Brazilian Society of Head and Neck Surgery / Brazilian Medical Association

Faculty Appointments

1987 – 2004 Assistant Professor of Head and Neck Surgery at the Department of Head and Neck Surgery – Post Graduate School of Medicine at the Catholic University of Rio de Rio de Janeiro

2004 – Present Chairman at the Department of Head and Neck Surgery – Post Graduate School of Medicine at the Catholic University of Rio de Janeiro

1987 – 1998 Attending Surgeon at the Head and Neck Surgery Service at the Brazilian National Cancer Institute / Rio de Janeiro

1998 – 2014, 2017 – Present Chief, Head and Neck Surgery Service at the Brazilian National Cancer Institute / Rio de Janeiro

2010 – Present Senior Researcher, program of Molecular Carcinogenesis at the Post Graduate program in Oncology of the Brazilian National Cancer Institute / Rio de Janeiro

Professional Activities

Member of numerous medical organizations including the Brazilian College of Surgeons, Brazilian Head and Neck Surgery Society, Brazilian Surgical Oncology Society, Latin American Thyroid Society, American College of Surgeons. International Corresponding Member of the American Head Neck Society, American Academy of Otolaryngology – Head and Neck Surgery, North American Skull base Society.

Faculty of the Post Graduate Course in Head and Neck Surgery of IFHNOS.

President of the Brazilian Society of Head and Neck Surgery 1999 – 2001

President elect of the World Federation of Skull Base Societies (Inauguration during the 8th World Federation of Skull Base Societies Meeting at Rio de Janeiro March 2022)

Coordinator of the Certification in Head and Neck Robotic Surgery (Console Surgeon Certification) of the Brazilian Society of Head and Neck Surgery / Brazilian Medical Association

Coordinator of the Certification in Head and Neck Robotic Surgery (Console Surgeon Certification) of the Fellowship Program in Head and Neck Surgery at the Brazilian National Cancer Institute of Rio de Janeiro / Strattner – Intuitive

Director, course on "New Technologies in the Management of Thyroid Diseases", IRCAD (Research Institute Against Digestive Cancer - Strasbourg / France) of Latin America at Rio de Janeiro – Brazil

Communications in Official Meetings and Congresses (both nationally and internationally): 184

Lectures and Conferences (both nationally and internationally): 127

Bibliography includes (both nationally and internationally): author/co-author of 187 original articles, editor/co-editor of 5 books in the field of Head and Neck, author/co-author of 81 book chapters

Member of several Editorial Boards in the field: Revista Brasileira de Cancerologia, Brazilian Journal of Head and Neck Surgery, The Otorhinolaryngology Club, The Open Otorhinolaryngology Journal, Journal of Endocrine Surgery (Korea), and Associate Editor of the ORL - Journal for Oto-Rhino-Laryngology, Head and Neck Surgery (Karger Eds. Switzerland)

Visiting Professor – Featured Guest Speaker:

2003 – University of Pittsburgh School of Medicine
2008 – Vittorio Veneto Hands-On Laryngeal Course – Vittorio Veneto, Italy
2020 – University of Pennsylvania at Philadelphia (virtual). Lecturer at the Grand Rounds of the Department of Otolaryngology.

PRESIDENTIAL CITATIONS

Awards

2000 – Honorary Member of the Chilean Society of Head and Neck Surgery
2000 – Honorary Member of the Peruvian Society of Head and Neck Surgery
2001 – Carlos Murillo de Vasconcelos Linhares Prize, XVII Congress of the Brazilian Society of Head and Neck Surgery
2004 – Oscar Alves Prize, Brazilian College of Surgeons
2008 – Poster of Distinction at 7th International Conference on Head and Neck Cancer
2013 – 5th Prize on Innovations in Medical Services – New paths in public health in Brazil – Sanofi and Portal Medical Services
2015 – The Laser Annals award for the best study during 2015: Cost Effectiveness of low-level laser therapy on head and neck cancer patients
Receiving concurrent chemoradiation. Oral Oncol , 2016 – 52

Mentorship at the Post Graduate Course in Oncology, of the Brazilian National Cancer Institute

Scientific initiation – 2 Orientations

Master of Science degree – 5 on going Orientations

Master of Science degree – 5 Orientations

Doctoral Thesis – 7 Orientations

H-Index other metrics

Scopus: 2321 Citations
h-index 27

Research Gate: 2870 Citations
12,722 Reads
RG Score 39.16
h-index 29

Additional significant contributions:

Director / Co-Director of several up-to-date courses in Head and Neck Surgery / Oncology, as well as hands-on courses (w/corpses in the lab) of Skull Base Surgery, Laryngeal Cancer Surgery and Thyroid Surgery.

Member of the executive committee of the 2002 IFHNOS Congress (Rio de Janeiro), president of the executive committee of IFHNOS Tour 2010 and 2016 in Rio de Janeiro, president of the executive committee of the Brazilian Head and Neck Congress 2017.

Coordinator of the Italian-Brazilian meeting in Head and Neck Surgery (w/ Giuseppe Spriano, MD, Milan - Italy), an yearly basis scientific meeting since 2007 with the aim of exchanging knowledge in the field between the two countries.

Mentorship of 94 fellows in Head and Neck Surgery at the Brazilian National Cancer Institute, most of them leaders in the field and Chiefs of Surgical Services in major cities and capitals of Brazil.

Responsible for the introduction of several "Minimally Invasive Techniques" (such as sialoendoscopy and video-assisted thyroidectomy...) at the Brazilian National Cancer Institute.

Author of the project: "Robotic Oncologic Surgery" for the Brazilian National Cancer Institute, the first public Brazilian Institute and Academic Hospital to perform Robotic Surgical Procedures (2012).

Console Surgeon for the first Radical Tonsillectomy (successful) in the Brazilian Public and Academic setting (March, 2012).

PRESIDENTIAL CITATIONS

Erle Robertson, PhD

Dr. Robertson is a leading investigator in the field of viral oncology over 30 years. He graduated from Howard University, and Wayne State University and completed post-doctoral studies at Harvard Medical School and Brigham and Women's Hospital. He began his independent career at the University of Michigan Medical School in 1997, then moved to the University of Pennsylvania in 2002 to lead the Tumor Virology program. He is currently the Director of the Tumor Virology training program, the Associate Director of Global Cancer Research at the Abramson Cancer Center, Vice Chair for Research and Director of Head and Neck Sciences in the Department of Otorhinolaryngology-Head and Neck Surgery. He is the Harry P. Shenk Endowed Chair Professor in the Department. He also holds secondary appointments in the Departments of Microbiology and Radiation Oncology. The Robertson group is dedicated to the study of virus-host interactions with a focus on viruses associated with cancers. Primarily, his group investigates two human oncogenic gammaherpesviruses Epstein-Barr virus (EBV), and Kaposi's sarcoma herpesvirus (KSHV), the causative agents driving numerous lymphoid and epithelial cancers. Infection by these viruses are typically asymptomatic. Our group investigates the mechanisms by which Epstein Barr virus (EBV) and Kaposi's sarcoma herpesvirus (KSHV) drives cell-mediated growth transformation and the oncogenic phenotype which leads to the associated cancers. We use a range of molecular and cutting-edge technological approaches to identify cellular pathways usurped by specific viral-encoded antigens, to develop mechanistic models for transformation by these human oncogenic gammaherpesviruses. Specifically, EBV is the causative agent of infectious mononucleosis (IM), Hodgkin's Lymphoma, Burkitt's lymphoma, nasopharyngeal and gastric carcinomas in distinct populations, and is a common infection in greater than 95% of the adult population that is seropositive for the virus. We investigate viral-encoded antigens critical for driving the oncogenic process in infected cells, and the cellular processes dysregulated during the transformation process. KSHV infection is less common in the Western countries, although a higher percentage of infected individuals is seen in specific geographic regions including sub-Saharan Africa, and in immunocompromised individuals infected with HIV. It is associated with Kaposi's sarcoma (KS), Multicentric Castleman's disease and Pleural effusion lymphomas. Kaposi's sarcoma (KS) is one of the most apparent AIDS defining illnesses and is still a major defining cancer in endemic HIV-geographic regions. The clinical presentation of AIDS-KS starts with a few cutaneous lesions in the oral cavity and extremities, but can rapidly disseminate to affect many organs. KSHV is the second human oncogenic herpesvirus with collinear homology to EBV and infects human B-cells and endothelial cells. Broadly, our group focuses on the strategies employed by these two viruses to dysregulate cellular processes that lead to uncontrolled cell division and includes cell cycle regulation, DNA repair, replication, gene expression and epigenetic regulation. Recently, we have explored the association of the virome and microbiome associated with human cancers to establish specific microbial signatures that can also be major drivers to HPV-associated cancers including head and neck cancers. Specific microbiome signatures may be protective, as well as contribute to the efficacy of therapeutics, maximizing benefits to patients. We have also developed a drug development pipeline and identified a lead compound that specifically targets the PI3K gamma isoform upregulated in cancers. We continue to explore the basic molecular strategies manipulated by these oncogenic viruses towards translational approaches to interventions that will lead to improved patient survival.

PRESIDENTIAL CITATIONS

Cherie-Ann Nathan, MD

Cherie-Ann Nathan, MD, FACS, is the Jack Pou Endowed Professor and Chair of the Department of Otolaryngology/Head and Neck Surgery at LSU-Health in Shreveport. She is also Director of Head and Neck Oncologic Surgery and Research at the Feist-Weiller Cancer Center and has a gratis appt. in the Dept. of Biochemistry & Molecular Biology. She completed her Otolaryngology/HNS residency and head and neck fellowship in 1995 at University of California, San Diego. She was a post-doctoral fellow at Johns Hopkins where she started her research career. Following her fellowship, she began her academic career at LSU-Health Sciences Center, Shreveport.

Her passion to improve outcomes for patients with head and neck cancer was the reason she moved from Mumbai India, where she went to medical school. She is a Surgeon-Scientist that maintains a busy practice treating head and neck cancer, thyroid, parathyroid, salivary gland tumors and skin cancer and she also leads an active research team. The National Cancer Institute has funded her translational research since 2000 and her work focuses on targeted therapy for head and neck squamous cell cancer patients. She is recognized nationally and internationally for her seminal work on molecular analysis of surgical margins. She has pioneered multi-institutional clinical trials using mTOR inhibitors in HNSCC patients. She has also received NIH funding for chemoprevention of cancer with curcumin and has a patent for a curcumin chewing gum. Her current RO1 "Targeting the FGFR-2 pathway for cutaneous SCC" holds potential for patients with aggressive cSCC. She has published extensively, has over 230 publications in peer-reviewed journals, and has authored multiple textbooks and encyclopedia chapters. She has given over 200 invited national and international lectures.

Dr. Nathan is the immediate Past-President of the American Head and Neck Society. She serves on many national committees some of which include the Board of Director for the American Board of Otolaryngology/HNS, American Academy of Otolaryngology/HNS Board of Directors, American College of Surgeons Board of Governors, the American Cancer Society-CDC HPV Steering Committee, ACGME Review Committee, Executive board of directors for the Head and Neck Cancer Alliance, Council Member for the Society of University Otolaryngology, Vice President of the US Collegium group and has served on the NCI Steering committee and the Larynx Preservation Guideline Panel for ASCO. She is currently chair for the ASTRO-ASCO-AHNS Multidisciplinary meeting and President of the Association of Academic Depts. of Otolaryngology/Head and Neck Surgery. She is also Section Editor for "Laryngoscope Investigative Otolaryngology". At the local level she is active, having been on the board of directors for Shreveport Medical Society, Disaster Reform committee and the Science Museum.

The Shreveport-Bossier Commerce Department awarded her the Athena Award for community service and she was inducted into Shreveport's 2019 Business Hall of Fame. She has been nominated as the Champion of Hope" Honoree by the American Cancer Society, Northwest LA 2020. She received the Leonard Tow Humanism award from the Arnold Gold Foundation and was also nominated into AOA by the medical students. The Board of Regents in Louisiana established the "Cherie-Ann Nathan Endowed Professorship in Otolaryngology/Head and Neck Surgery" initiated by grateful patients to honor her dedication and expertise. She has consistently been recognized in the "Best Doctors of America" and received the AHNS, Academy of Oto/HNS and Western Section of the Triological society Presidential citation & Distinguished service awards. She received the 2020 Margaret Butler Outstanding Mentor of Women in Head & Neck Surgery Award.

Dr. Nathan is married to pulmonary and critical care physician Raghu Nathan, and they have two boys Sean and Neil. Her favorite hobby was to perform with the "Nathan Family Trio" to raise money for the Arts and Cancer research in Shreveport.

Anne Moore O'Malley

Anne was born and raised in Houston, Texas. She earned her Bachelor of Science degree from The University of Texas with a major in Education and a minor in Music. She later received her Master's degree from University of North Texas. After teaching for 7 years, Anne stayed home to raise 3 children and to manage the home and her husband of 35 years.

In her moves from Maryland to Pennsylvania, Anne became known as the "House Whisperer" as she renovated historic homes and estates along the Main Line outside of Philadelphia. She also opened her own boutique real estate company which she still owns and operates today. Anne is a master bridge player having played in hundreds of sanctioned tournaments locally and nationally. She is also an avid golfer and enjoys playing on the Merion Golf Club's Ladies Team. However, she loves playing golf with her husband and grown children the most.

Anne is passionate about wildlife, earning the nickname of "Mother Nature" from her children. In particular she loves feeding and watching "her" wild birds and spotting critters and exotic animals everywhere she travels. Some of Anne's fun highlights include playing hockey for "The Mother Puckers", singing with the National Symphony as a member of the Baltimore Choral Arts Society, and being a Marshall for the 2013 US Open at Merion Golf Club. Anne's favorite times, though, are with her fun children and children in law, her loyal dog Blue, and yes even her husband, Bert. A soon to be favorite will be the birth of her first grandchild and being a grandparent.

PRESIDENTIAL CITATIONS

Christopher H. Rassekh, MD

Dr. Rassekh grew up in Council Bluffs, Iowa and completed his BS and MD at the University of Iowa where he was accepted to medical school after 3 years undergraduate. He also did his residency in Otolaryngology and a research fellowship at Iowa. He did his surgical internship at Michigan State University and his fellowship in Head and Neck Oncology and Cranial Base Surgery at the University of Pittsburgh. He was Assistant Professor at UTMB in Galveston from 1993-1999 and became head and neck fellowship director there and then went to WVU where he was Associate Professor and Director of Head and Neck Surgery from until 2010. In 2011, he joined the faculty at the University of Pennsylvania to help build the Transoral Robotic Surgery program shortly after FDA approval, having been one of the first 12 surgeons trained in TORS by the inventors, Drs. O'Malley and Weinstein. He became interested in sialendoscopy in 2002 after visiting Dr. Marchal in Geneva and then received formal training in 2007 at the 3rd International Salivary Gland Congress in Pittsburgh. Shortly after arriving at Penn where he was recruited to start a novel academic surgery model called the "surgeonist", he developed what was eventually the Airway Safety Program and also initiated the Sialendoscopy program which he has led since that time. He has been an active member of the North American Skull Base Society for 30 years and has served on the board of directors and numerous committees including the scientific program committee and is currently the Chair of the Education committee. He has been an active member of the American Academy of Otolaryngology-Head and Neck Surgery throughout his career and was awarded the distinguished service award from that organization. He has won resident teaching awards at WVU twice and Penn once. He was promoted to Professor at Penn in 2018 and also received the George Strawbridge award for excellence in ORL-HNS from the department in 2019. He was inducted into the Penn Medicine Academy of Master Clinicians in 2019, the highest award for a clinician. He was inducted into the Triological society in 2018. As an active member of the American Head and Neck Society throughout his career, he served on the education committee, the program committee and is now very active in the skull base and salivary gland sections. He organized the 5th International Congress on Salivary Gland diseases in 2019 in Philadelphia which was endorsed by the AAO-HNS, AHNS and the MSGS (formerly the European Salivary Gland Society) and is at-large board member for MSGS. He continues to develop the interface between TORS and both airway and salivary gland diseases and has published many articles, book chapters and presented educational sessions in these domains as well as in numerous aspects of head and neck oncology including neck dissection and laryngeal organ preservation surgery. He wishes to thank his many mentors, colleagues and trainees for over 30 years of valuable teaching and comradery.

Rodney Taylor, MD, MPH

Rodney J Taylor MD, MSPH is Professor and Chairman of the of Department of Otorhinolaryngology- Head & Neck Surgery at the University of Maryland of School of Medicine. He joined the faculty in 2001 and is a surgeon-scientist whose clinical practice is dedicated to the comprehensive care of head and neck cancer (HNC) patients and performs complex surgical procedures in the management of HNC patients.

Prior to arriving at the University of Maryland, Dr. Taylor graduated cum laude from Harvard College in 1991 where he was Senior Class President, Varsity Football player and was active in both student government and multicultural activities. He attended Harvard Medical School and received his medical degree in 1995. He then completed his residency in Otolaryngology- Head and Neck surgery at the University of Michigan. While at the University of Michigan he also received a master's degree from the School of Public Health.

Dr. Taylor's research expertise includes head and neck cancer disparities in treatment and outcome for underrepresented and disadvantaged patients. He also has basic science and translational interests, which include studying ZSCAN4 as part of a system that confers and maintains cancer cell immortality in HNC. Related, he studies the role of ZSCAN4 and its effect on adult mesenchymal stem cells (MSCs) harvested from tonsillar tissue for the development of clinical applications for regenerative medicine following ablative surgical and cancer treatments.

In addition to his clinical and research pursuits, he is a key leader in the UMSOM promoting Diversity and Inclusion and providing Unconscious Bias training for its faculty and staff. Dr. Taylor also serves on the executive committee of the UMSOM Faculty Group Practice. He is chair of the AAOHNS Head and Neck Surgery & Oncology committee and serves on the AAOHNS Diversity of Committee. He is also passionate and active on a local and national level in providing mentorship to increase underrepresented individuals in healthcare and research fields.

MARGARET F. BUTLER OUTSTANDING MENTOR OF WOMEN IN HEAD AND NECK SURGERY AWARD

Dr. Margaret Butler was the first female Otolaryngology chair in the United States. In 1906, she was appointed Chair of Ear, Nose and Throat at Women's Medical College of Pennsylvania. As a respected otolaryngologist and an ambassador of the specialty, Dr. Butler provided a blueprint for future generations of female otolaryngologists.

The purpose of the Margaret F. Butler, MD Champion of Women in Head and Neck Surgery Award is to recognize individuals who have demonstrated leadership in promoting gender diversity in the field of Head and Neck Surgery and its related endeavors Awardees have demonstrated leadership and consistent track record of promoting gender diversity and equity in head and neck surgery, and its related fields; have consistently supported and promoted women in head and neck surgery and its related endeavors, as well as mentoring individuals through merit-based career advancements and promotions; and have measurable impact in the promotion of women in head and neck surgery and its related fields, i.e. career advancement of mentees, mentorship in publications and research.

Awardee:

2022 | Amy Y. Chen, MD, MPH, FACS

Amy Y. Chen, MD, MPH, FACS

Amy Y. Chen, MD, MPH, FACS is the Willard and Lillian Hackerman Professor and the Inaugural Vice Chair for Diversity, Equity and Inclusion of the Department of Otolaryngology and Head and Neck Surgery at The Emory University School of Medicine. She serves as the Director of Head and Neck Endocrine Surgery and was the Program Director for the Head and Neck Surgery Fellowship. Her expertise is in thyroid and parathyroid surgery. She has a joint appointment at Winship Cancer Institute and at Emory's Rollins School of Public Health. She has also served as Director of Health Services Research in the Department of Surveillance and Health Policy Research of the American Cancer Society. She serves on the Board of the American Thyroid Association and Partnership for Southern Equity.

Dr. Chen has been instrumental in developing a team approach to patient care. She developed and currently leads the multidisciplinary thyroid and head and neck tumor conferences. Her primary focus of research is in measuring outcomes of oncology treatment as well as measuring determinants of successful outcomes of care. Dr. Chen's research agenda is to create a multi-disciplinary, multi-site center dedicated to health services research, outcomes, and quality of care. Her secondary focus of research is directed toward translational research of head and neck and thyroid malignancies. She is also an unconscious bias facilitator and a diversity, equity and inclusion champion.

Dr. Chen joined the Emory faculty in 2001 after a fellowship in Head and Neck Oncologic Surgery at the MD Anderson Cancer Center in Houston. Prior to that fellowship she was a resident in Otolaryngology and General Surgery at Baylor College of Medicine, also in Houston.

She is board certified by the American Board of Otolaryngology and holds a Master of Public Health degree from the University of Texas School of Public Health. Dr. Chen has received numerous awards and honors, among them the Emory School of Medicine Excellence in Diversity, Equity and Inclusion Award, Top Atlanta Doctor, Gussack Memorial Award for Teaching, Percy Memorial Research Award, the Rande Lazar Health Services Research Award, the American Head and Neck Society Scholarship Award, and The Women's Fund for Health, Education and Research Grant. She is married and is the proud mother of two adult daughters and a rescue yellow Labrador retriever.

CONGRATULATIONS TO THE AHNS 2022 MANUSCRIPT AWARD WINNERS!

Robert Maxwell Byers Award: Lurdes Queimado,MD, PhD, Entitled work: *Exposure to secondhand smoke extract increases cisplatin resistance in head and neck cancer cells*

Best Prevention and Early Detection Paper: Tabitha L. I. Galloway, Entitled work: *Targeting the Rebellion: Cancer Prevention through Human Papilloma Virus 2 Vaccine Education of College Students*

Randal Weber, MD Quality, Safety, Value in HN Oncology Award: Nathan Farrokhian, BS, BA, Entitled work: *Multi-institutional insight into the prognostic significance of quantitative measures neck dissection quality in clinically node negative oral cavity squamous cell carcinoma.*

Best Resident Clinical Paper: Dr. Sallie Long, Entitled work: *Comparison of objective measures of trismus and salivation with patient-reported outcomes following treatment for head and neck cancer*

Best Resident Basic Science Paper: Dr. Liyona Kampel, Entitled work: *Utilizing Circulating Tumor DNA for Risk Level Stratification of Head and Neck Squamous Cell Carcinoma*

PAST PRESIDENTS

The American Head and Neck Society:

Cherie Ann Nathan, MD (2020-2021)
Ehab Hanna, MD (2019)
Jonathan Irish, MD, MSc, FRCSC (2018)
Jeffrey N. Myers, MD, PhD (2017)
Dennis Kraus, MD (2016)
Douglas A. Girod (2015)
Terry A. Day, MD (2014)
Mark K. Wax, MD (2013)
Carol R. Bradford, MD (2012)
David W. Eisele, MD (2011)
John A. Ridge, MD (2010)
Wayne M. Koch, MD (2009)
Gregory T. Wolf, MD (2008)
Randal S. Weber, MD (2007)
John J. Coleman, III, MD (2006)
Patrick J. Gullane, MD (2005)
Jonas T. Johnson, MD (2004)
Paul A. Levine, MD (2003)
Keith S. Heller, MD (2002)
Ernest A. Weymuller, Jr., MD (2001)
Jesus E. Medina, MD (2000)
Ashok R. Shaha, MD (1999)
K. Thomas Robbins, MD (1999)

The American Society for Head and Neck Surgery:

Dale H. Rice, MD (1997-98)
Nicholas J. Cassisi, MD (1996-97)
Charles W. Cummings, MD (1995-96)
Gary L. Schechter, MD (1994-95)*
James Y. Suen, MD (1993-94)
Bryon J. Bailey, MD (1992-93)
Michael E. Johns, MD (1991-92)
Helmuth Goepfert, MD (1990-91)
Willard N. Fee, Jr., MD (1989-90)
Eugene N. Myers, MD (1988-89)
Charles J. Krause, MD (1987-88)
John M. Lore, Jr., MD* (1986-87)
Robert W. Cantrell, MD (1985-86)
Hugh F. Biller, MD (1984-85)
Paul H. Ward, MD (1983-84)
Jerome C. Goldstein, MD (1982-83)
Douglas B. Bryce, MD* (1981-82)
J. Ryan Chandler, MD* (1980-81)
Loring W. Pratt, MD (1979-80)
William M. Trible, MD* (1978-79)
John A. Kirchner, MD (1977-78)
George F. Reed, MD* (1976-77)
Emanuel M. Skolnick, MD* (1975-76)
Daniel Miller, MD* (1974-75)
Charles M. Norris, MD* (1973-74)
Edwin W. Cocke, Jr., MD* (1972-73)
Burton J. Soboroff, MD* (1971-72)
John S. Lewis, MD* (1970-71)
George A. Sisson, MD* (1969-70)
W. Franklin Keim, MD* (1967-69)
John F. Daly, MD* (1965-67)
Joseph H. Ogura, MD* (1963-65)
Paul H. Holinger, MD* (1961-63)
John J. Conley, MD* (1959-61)

The Society of Head and Neck Surgeons:

Ronald H. Spiro, MD (1998)
John R. Saunders, Jr., MD (1997)
Robert M. Byers, MD (1996)
Michael B. Flynn, MD (1995)
J. Edward M. Young, MD (1994)
Stephen Ariyan, MD (1993)
Oscar Guillamondegui, MD (1992)
Jatin P. Shah, MD (1991)
M.J. Jurkiewicz, MD* (1990)
James T. Helsper, MD* (1989)
Robert D. Harwick, MD (1988)
William R. Nelson, MD* (1987)
Frank C. Marchetta, MD* (1986)
Alando J. Ballantyne, MD* (1985)
Darrell A. Jaques, MD (1984)
Alvin L. Watne, MD (1983)
John M. Moore, MD (1982)
Elliot W. Strong, MD (1981)
Robert G. Chambers, M.D.* (1980)
John C. Gaisford, MD (1979)
William A. Maddox, MD (1978)
Donald P. Shedd, MD (1977)
Condict Moore, MD (1976)
Richard H. Jesse, MD* (1975)
Alfred Ketcham, MD* (1974)
Robin Anderson, MD* (1973)
Charles C. Harrold, MD* (1972)
Harvey W. Baker, MD* (1971)
Ralph R. Braund, MD* (1970)
William S. MacComb, MD* (1969)
Arthur G. James, MD* (1968)
Oilver H. Beahrs, MD* (1967)
Edgar L. Frazell, MD* (1966)
Harry W. Southwick, MD* (1965)
Calvin T. Kloop, MD* (1964)
H. Mason Morfit, MD* (1962-63)
Arnold J. Kremen, MD (1960-61)
Danely P. Slaughter, MD* (1959)
Grant Ward, MD * (1958)
Hayes Martin, MD* (1954-1957)

**Deceased*

AHNS FOUNDATION 2021-2022 CENTURION CLUB AND FIVE IN FIVE MEMBERS

Bruce Campbell
Robert Ferris*
Howard Francis
Neil Futran
Boyd Gillespie
Francis Howard
Gina Jefferson
Kiran Kakarala
Dennis Kraus*
Ellie Maghami
Michael Moore
Jeffrey Myers*
Cherie-Ann Nathan*
Nitin Pagedar
Chris Rassekh
Margaret Resto
James Rocco
Yelizaveta Shnayder
Christine Tobias
Tamara Watts
Mark Wax
Robert Weisman
Wendell Yarbrough
Bevan Yueh

* Five in Five Members = $5,000 a year for five years

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AHNS ACCREDITATION

To receive your CME credit:

AHNS has instituted a process for claiming CME credits and printing certificates. All attendees wishing to receive a CME certificate for activities attended at the AHNS 2022 Annual Meeting must first complete an on-line meeting evaluation form. An email will be sent to attendees with a link to the on-line survey and claim form. For any questions, please contact erin@bscmanage.com.

Accreditation Statement

The American Head & Neck Society (AHNS) is accredited by the Accreditation Council for Continuing Medical Education (ACCME) to provide Continuing Medical Education for physicians.

Credit Designation Statement

The AHNS designates this live activity for a maximum of **13.5 *AMA PRA Category 1 Credit(s)™***. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

Successful completion of this CME activity, which includes participation in the evaluation component, enables the participant to meet the expectations of the American Board of Otolaryngology's Maintenance of Certification (MOC) program. It is the CME activity provider's responsibility to submit participant completion information to ACCME for the purpose of recognizing participation.

COMMERCIAL BIAS REPORTING FORM

You are encouraged to ...

1. Document (on this form) any concerns about commercially-biased presentations/materials during educational sessions,
2. Make suggestions about how bias might have been avoided/minimized, and
3. Immediately take your completed form to the AHNS staff at the Registration Desk

Your feedback will be shared with a member of the CME Compliance Committee, who will make the faculty aware of the concerns and/or suggestions.

For the full presenter listing and disclosures, please visit https://www.ahns.info/ahns-cosm-2022-presenter-disclosures/

Commercial Bias

The AHNS CME Compliance Committee has defined "bias" as *an existing predisposition that may interfere with objectivity in judgment. Bias may be minimized through prior declaration of any source of conflict of interest, reference to evidence-based literature and expert opinions, and/or an independent peer-review process.*

If an educational presentation certified for CME includes bias of any commercial interests*, please provide the following details:

*(*Commercial interest is defined by the ACCME as an entity producing, marketing, re-selling, or distributing health care goods or services consumed by, or used on, patients.)*

Presentation:
(eg session name, etc)

Commercial Bias by:
(ie faculty name, company rep)

Promotion via:
(eg handouts, slides, what they said, actions)

Commercial Bias about:
(check all that apply)

- ❑ Patient treatment/management recommendations were not based on strongest levels of evidence available.
- ❑ Emphasis was placed on one drug or device versus competing therapies, and no evidence was provided to support its increased safety and/or efficacy.
- ❑ Trade/brand names were used.
- ❑ Trade names versus generics were used for all therapies discussed.
- ❑ The activity was funded by industry and I perceived a bias toward the grantors.
- ❑ The faculty member had a disclosure and I perceived a bias toward the companies with which he/she has relationships.
- ❑ Other (please describe):_____

Suggestions for avoiding or minimizing bias:

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SCIENTIFIC PROGRAM

WEDNESDAY, APRIL 27, 2022

8:00 am – 8:30 am **Landmark A**

Introduction & Awards

Brian Burkey, MD
Bert W. O"Malley, Jr., MD

8:30 am – 9:00 am **Landmark A**

Presidential Address - People, Passion and the Pursuit of Excellence

Bert W. O'Malley, Jr., MD

9:00 am – 9:45 am **Landmark A**

Distinguished Keynote Lecture - Steroid Receptor Coactovators: These masters of the genome in health and disease lead to a novel therapy for cancers.

Bert O'Malley, Sr., MD

9:45 am-10:15 am

Break with Exhibitors

10:15 am – 11:15 am **Landmark A**

The Fight Against Misinformation: Cancer Care in the Social Media Era-Risks, Benefits....Alternatives?

Moderator: Arvind Badhey, MD

Panelists: Sarah Bowe, MD; Elizabeth Cottrill, MD; Alice L. Tang, MD

We use a situation-based format to discuss the role social media can play in patient's information on their cancer care. We will discuss how patients obtain information and how we, as otolaryngologists, can help them be informed as they sift through data. Should head and neck cancer physicians be mobilizing on social media platforms to engage patients, inform patients, promote care? (What is ok and what isn't).

10:15 am – 12:00 pm **Landmark B**

Innovation and Technology in the Assessment of Surgical Margins

Moderator: Stephen Kang, MD

Current State and Controversies in Margin Assessment - *Stephen Kang, MD*

Precision Surgery and New Frontiers in Head and Neck Cancer - *Maie St. John, MD, PhD*

Intraoperative Molecular Imaging in Head and Neck Cancer - *Eben Rosenthal, MD*

Shifting the Paradigm of Surgeon/Pathologist Conversations: 3D Representations of Specimens and Defects for Margin Localization - *Margaret Brandwein-Weber, MD*

Molecular Margins: Challenges and Future Directions - *Sidharth Puram, MD, PhD*

11:15 am – 12:00 pm **Landmark A**

Oral Abstract Session: Cancer Biology

Moderators: Daniel Faden, MD & Natalie Silver, MD

AHNS01: RISK LEVEL STRATIFICATION USING CIRCULATING TUMOR DNA IN HEAD AND NECK CANCER PATIENTS
Liyona Kampel, MD, PhD; Sara Davidova, MD; Shlomo Zuriel, PhD; Narin Carmel Neiderman, MD; Dov Hershkovitz, MD, PhD; Nidal Muhanna, MD, PhD; Tel Aviv Sourasky Medical Center

AHNS02: EVEROLIMUS INHIBITS P53 MUTANT HNSCC BY MODULATING ANGIOGENESIS AND LYMPHANGIOGENESIS MECHANISMS LINKED TO MTOR/HIF1A/VEGF SIGNALING
Janmaris Marin Fermin; Md Maksudul Alam, PhD; Kyle A Boudreaux, MS, IV; Landon D Goodreau; Taylor L Powell; Tara Moore-Medlin; Xiaohua Rong; Jerry McLarty; Xin Gu; Cherie-Ann O Nathan; LSU-Health Shreveport

AHNS03: RADIATION IMPROVES THE THERAPEUTIC ANTIBODY DELIVERY IN HEAD AND NECK CANCERS.
Laura Freeman, MD; Guolan Lu, PhD; Eben Rosenthal; Stanford

AHNS04: CHARACTERIZING THE TUMOR MICROENVIRONMENT OF IMMUNOSUPPRESSED CUTANEOUS SQUAMOUS CELL CARCINOMA
Mica Glaun, MD[1]; Frederico Gleber-Netto, PhD[1]; Priyadharsini Nagarajan, MD[1]; Tongxin Xie[1]; Jennifer Covello[1]; Shamima Akhter[1]; Adebayo Adewale[1]; Erez Baruch[1]; Michael Wong[1]; Kenneth Tsai[2]; Elsa Flores[2]; Michael Migden[1]; Deborah Silverman[1]; Ryan Goepfert[1]; Yejing Ge[1]; Padamanee Sharma[1]; James Allison[1]; Jeffrey Myers[1]; Neil Gross[1]; Moran Amit[1]; [1]MD Anderson Cancer Center; [2]Moffitt Cancer Center

AHNS05: NEUTROPHIL TO LYMPHOCYTE RATIO AND PERIPHERAL BLOOD BIOMARKERS CORRELATE WITH OUTCOMES AMONG PATIENTS WITH RECURRENT METASTATIC HEAD AND NECK SQUAMOUS CELL CARCINOMA AND SALIVARY GLAND CANCER TREATED ON A PHASE II TRIAL OF PEMBROLIZUMAB AND VORINOSTAT
Cassie Pan[1]; Qian (Vicky) Wu[2]; Jenna Voutsinas[2]; Jeffrey J Houlton[1]; Brittany Barber[1]; Neal Futran[1]; Renato G Martins[3]; Jonathan R Fromm[4]; Cristina P Rodriguez[3]; [1]Department of Otolaryngology, University of Washington, Seattle, WA; [2]Public Health Sciences Division, Fred Hutchinson Cancer Research Center, Seattle, WA; [3]Division of Oncology, Department of Medicine, University of Washington, Seattle, WA; [4]Department of Laboratory Medicine, University of Washington, Seattle, WA

AHNS06: MASS SPECTROMETRY IMAGING OF THE METABOLIC LANDSCAPE OF HUMAN PAPILLOMAVIRUS-ASSOCIATED VERSUS CARCINOGEN-DRIVEN HEAD AND NECK SQUAMOUS CELL CARCINOMA
Richard A Harbison, MD[1]; William Andrews[2]; Rajeev Pandey[1]; Rebecca Dempsey[1]; Rajarsi Mandal[1]; Robert Casero[1]; Drew Pardoll[1]; Carole Fakhry[1]; Maureen Kane[2]; Jonathan Powell[1]; Erika Pearce[1]; [1]Johns Hopkins Hospital; [2]University of Maryland

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AHNS07: 5-AMINOLEVULINIC ACID FLUORESCENCE-GUIDED SURGERY IN HEAD AND NECK SQUAMOUS CELL CARCINOMA: A PILOT TRIAL
Peter Filip; David Lerner; Katherine Liu; Evan Kominsky; Brandon Gold; Annie Arrighi-Allisan; David Campbell; Mohemmed N Khan; Scott Roof; Constantinos Hadjipanayis; Eric Genden; Alfred Marc Iloreta; Icahn School of Medicine at Mount Sinai

12:00 pm – 1:00 pm

Lunch with Exhibitors

1:00 pm – 2:00 pm **Landmark A**

Hayes Martin Lecture - The Surgical Innovation Continuum

Keynote Speaker: Gregory Weinstein, MD

2:00 pm – 2:45 pm **Landmark A**

Best of Oral Abstract Session

Moderators: Nicole Schmitt, MD & Thomas Ow, MD

AHNS08: PERIOPERATIVE TOPICAL ANTISEPSIS AND SURGICAL SITE INFECTION IN UPPER AERODIGESTIVE FREE FLAP RECONSTRUCTION
Ahmed S Beydoun, MD[1]; Andrew Holcomb, MD[2]; Priscilla Pichardo, DO[3]; Nicholas C Purdy, DO, FACS[3]; Chase M Heaton, MD[4]; Caitlin McMullen, MD[5]; Jessica A Yesensky, MD[6]; Michael Moore, MD[6]; Neerav Goyal, MD, MPH[7]; Joshua Kohan, BA[8]; Mirabelle Sajisevi, MD[8]; Kenneth Tan, BS[9]; Daniel Petrisor, MD, DDS[9]; Mark K Wax, MD, FACS, FRCS[9]; Zain Hassan, BS[10]; Skylar Trott, MD[10]; Andrew Larson, MD[11]; Jeremy D Richmon, MD[11]; Evan Graboyes, MD, MPH, FACS[12]; C B Wood, MD[13]; Ryan S Jackson, MD[13]; Patrik Pipkorn, MD[13]; Sid V Puram, MD, PhD[13]; Joseph Zenga, MD[1]; [1]Medical College of Wisconsin; [2]Nebraska Methodist Health System; [3]Geisinger Medical center; [4]University of California, San Francisco; [5]Moffitt Cancer Center; [6]Indiana University School of Medicine; [7]Penn State College of Medicine; [8]University of Vermont Medical Center; [9]Oregon Health & Science University; [10]University of Kentucky; [11]Massachusetts Eye and Ear/Harvard Medical School; [12]Medical University of South Carolina College of Medicine; [13]Washington University School of Medicine

AHNS09: EFFECT OF PREOPERATIVE IMMUNOTHERAPY ON COMPLICATIONS AFTER HEAD AND NECK SURGERY
Ramez Philips, MD; Angela Alnemri; Adam Luginbuhl, MD; David Cognetti, MD; Joseph Curry, MD; Thomas Jefferson University Hospitals

AHNS10: SUCCESS AND OUTCOMES FOLLOWING A SECOND SALVAGE ATTEMPT FOR FREE FLAP COMPROMISE: IS IT WORTHWHILE
Allison A Slijepcevic, MD[1]; Justin Shinn, MD[2]; Steve Cannady, MD[2]; Matthew M Hanasono, MD[3]; Matthew Old, MD[4]; Joseph M Curry, MD[5]; Jeewanjot Grewal, MD[6]; Tamer Ghanem, MD[6]; Yadro Ducic, MD[7]; Brett A Miles, MD[8]; Mark K Wax, MD[1]; [1]Oregon Health and Science University; [2]University of Pennsylvania; [3]MD Anderson; [4]The Ohio State University; [5]Thomas Jefferson University Hospitals; [6]Henry Ford Hospital; [7]Head and Neck Oncologic, Reconstructive, & Skull Base Surgery; [8]Mount Sinai

AHNS11: WPOI-5 CAN BE ACCURATELY IDENTIFIED DURING INTRAOPERATIVE CONSULTATION AND ALSO PREDICTS OCCULT CERVICAL METASTASES
John E Beute, BA[1]; Lily A Greenberg, BA[1]; Lauren Wein, BA[1]; Eric M Dowling, MD[2]; Kayvon F Sharif, BA[1]; Ammar Matloob, MD[3]; Ippolito Modica, MD[3]; Daniel Chung, MD[3]; Mohemmed Nazir Khan, MD[2]; Raymond L Chai, MD, FACS[2]; Margaret S Brandwein-Weber, MD[3]; Mark L Urken, MD, FACS[2]; [1]Thyroid, Head & Neck Cancer (THANC) Foundation; [2]Department of Otolaryngology-Head and Neck Surgery, Icahn School of Medicine at Mount Sinai; [3]Department of Pathology, Icahn School of Medicine at Mount Sinai

2:00 pm – 2:45 pm **Landmark B**

Oral Abstract Session: Quality of Life and Functional Outcomes

Moderators: Carol Lewis, MD & Neerav Goyal, MD

AHNS12: THROMBOPROPHYLAXIS AFTER MAJOR HEAD AND NECK SURGERY IN PATIENTS WITH HEAD AND NECK CANCER
F. Jeffrey Lorenz, BS; Brandon Martinazzi, BS; Neerav Goyal, MD, MPH; Penn State College of Medicine

AHNS13: CLINICIAN-GRADED AND PATIENT-REPORTED SWALLOWING OUTCOMES BY EAT AND EXERCISE STATUS DURING OROPHARYNGEAL RADIOTHERAPY: PRELIMINARY RESULTS FROM A PROSPECTIVE REGISTRY
CE A Barbon, PhD; A C Moreno, MD; S Y Lai, MD, PhD; C Peterson, PhD; J Reddy, MD, PhD; A Sahli, BS; F M Johnson, MD, PhD; C D Fuller, MD, PhD; K A Hutcheson, PhD; The University of Texas MD Anderson Cancer Center

AHNS14: EVALUATION OF A DEFICIT ACCUMULATION FRAILTY INDEX AS A PREDICTOR OF OUTCOMES IN HEAD AND NECK CANCER PATIENTS.
Axel Sahovaler; Susie Su; Sharon Tzelnick; John de Almeida; Ralph Gilbert; Jonathan Irish; Xu Wei; Shabbir Alibhai; David Goldstein; University of Toronto

AHNS15: FUNCTIONAL OUTCOMES OF OROPHARYNGEAL RESECTION AND FREE FLAP RECONSTRUCTION AFTER HEAD AND NECK RADIATION: A MULTI-INSTITUTIONAL STUDY
Patrick Tassone, MD[1]; Margaret Wieser[1]; Alyssa Givens[2]; Zachary Elliott[2]; Ramez Philips, MD[2]; Joseph Curry, MD[2]; Louis-Xavier Barrette[3]; Steven Cannady, MD[3]; Chenge Mahomva, MD[4]; Eric Lamarre, MD[4]; Brandon Prendes, MD[4]; Katelyn Robillard, PhD[5]; Larissa Sweeny, MD[5]; [1]University of Missouri; [2]Thomas Jefferson University; [3]University of Pennsylvania; [4]Cleveland Clinic Foundation; [5]Louisiana State University

AHNS17: OBJECTIVE MEASURES OF 1TRISMUS AND SALIVATION POORLY PREDICT PATIENT-REPORTED OUTCOMES FOLLOWING RADIATION FOR HEAD AND NECK CANCER
Sallie M Long, MD[1]; Annu Singh, BDS[2]; Amy L Tin, MA[3]; Bridget O'Hara, BSN, RN[2]; Marc A Cohen, MD, MPH[4]; Nancy Lee, MD[5]; David G Pfister, MD[6]; Tony Hung, MD, MBA, MSCR[6]; Richard J Wong, MD[4]; Andrew J Vickers, PhD[3]; Cherry L Estilo, DMD[2]; Jennifer R Cracchiolo, MD[4]; [1]NewYork-Presbyterian Hospital/Weill Cornell; [2]Dental Service, Memorial Sloan Kettering Cancer Center; [3]Health Outcomes Research Group, Department of Epidemiology and Biostatistics, Memorial Sloan Kettering Cancer Center; [4]Head and Neck Service, Department of Surgery, Memorial Sloan Kettering Cancer Center; [5]Department of Radiation Oncology, Memorial Sloan Kettering Cancer Center; [6]Department of Medicine, Medical Oncology, Memorial Sloan Kettering Cancer Center

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AHNS18: IMPLEMENTING A PREOPERATIVE QUALITY IMPROVEMENT PROTOCOL FOR GERIATRIC HEAD AND NECK CANCER PATIENTS RESULTS IN DECREASED UNPLANNED READMISSIONS
Lindsay M Olinde, MD; Beverly Garber, ANPC; Elizabeth Gould, NP; Marianne Abouyared, MD; UC Davis Department of Otolaryngology

2:45 pm – 3:15 pm

Break with Exhibitors

3:15 pm – 4:15 pm **Landmark A**

Great Debate! SLNBx vs. MRND in Early Stage Oral Cavity

***Sponsored by the Mucosal Section**

Moderator: Susan McCammon, MD

Panelists: Stephen Lai, MD, PhD & Eric Genden, MD

3:15 pm – 4:05 pm **Landmark B**

Transoral Robotic Approaches in Salivary Surgery: When, Where, and How? *AHNS acknowledges generous educational grant support of this sessions from Intuitive Surgical.*

Moderator: Alexandra Kejner, MD

Transoral Robotic Parapharyngeal Space Resections - *Andres Bur, MD*

Transoral Robotic Submandibular Gland Excision - *Christopher Rassekh, MD*

Transoral Robotic Oropharyngeal Resection for Minor Salivary Gland Tumors - *William Ryan, MD*

Panel Discussion/Audience Participation with Moderator - *Alexandra Kejner, MD*

This session will used a case-based format with panel discussion and audience participation to highlight the utility of transoral robotic approaches in salivary surgery. Management of parapharyngeal space masses, minor salivary gland tumors of the pharynx, and the submandibular gland will be discussed, with controversies and surgical pearls highlighted.

4:15 pm – 5:00 pm **Landmark A**

Oral Abstract Session: Oral Larynx

Moderators: Evan Graboyes, MD & Lisa Shnayder, MD

AHNS19: SURGICAL OUTCOMES IN ORAL CAVITY SQUAMOUS CELL CARCINOMA TREATED WITH NEOADJUVANT PEMBROLIZUMAB
Thomas O'Neil, BS[1]; Sean McDermott, MD[2]; Raisa Tikhtman, MD[2]; Yash Patil, MD[2]; Alice Tang, MD[2]; Brian Cervenka, MD[2]; Trisha Wise-Draper, MD, PhD[2]; Chad Zender, MD[2]; [1]University of Cincinnati College of Medicine; [2]University of Cincinnati Medical Center

AHNS20: RATES OF SALVAGE LARYNGECTOMY FOLLOWING ORGAN PRESERVATION THERAPY: CURRENT STATUS IN EARLY AND ADVANCED STAGE CANCERS
Jacqueline Tucker, BS[1]; Maxwell Wright, BS[1]; Neerav Goyal, MD, MPH, FACS[2]; [1]Penn State College of Medicine; [2]Department of Otolaryngology - Head and Neck Surgery, Penn State Milton S. Hershey Medical Center

AHNS21: FACTORS PREDICTING PHARYNGOCUTANEOUS FISTULA IN PATIENTS AFTER SALVAGE LARYNGECTOMY - A MULTICENTER COLLABORATIVE COHORT STUDY
Conall W Fitzgerald, MD[1]; Joel C Davies, MD[2]; John R de Almeida, MD[2]; Sabrina Rashid, MPH[2]; Antoine Eskander, MD[3]; Eric Monteiro, MD[3]; Ximena Mimica, MD[1]; Marlena McGill, MPH[1]; Tim Mclean, MD[1]; Jennifer R Cracchiolo, MD[1]; Ian Ganly, MD[1]; Ahmed Teaima, MD[4]; Samantha Tam, MD[4]; Dongmin Wei, MD[4]; Ryan Goepfert, MD[4]; Jie Su, MSc[5]; Wei Xu, PhD[5]; Mark Zafereo, MD[4]; David P Goldstein, MD[6]; Marc A Cohen, MD[1]; [1]Head & Neck Service, Memorial Sloan Kettering Cancer Center, New York, New York, USA; [2]Department of Otolaryngology-Head & Neck Surgery, University of Toronto, Toronto, Ontario, Canada; [3]Department of Otolaryngology-Head & Neck Surgery, Mt Sinai Hospital, University of Toronto, Toronto, Ontario, Canada; [4]Department of Head & Neck Surgery, MD Anderson Cancer Center, Houston, Texas, USA; [5]Department of Biostatistics, Princess Margaret Cancer Centre, University Health Network, Toronto, Ontario, Canada; [6]Princess Margaret Cancer Centre, University Health Network, Toronto, Ontario, Canada

AHNS22: MULTI-INSTITUTIONAL INSIGHT INTO THE PROGNOSTIC SIGNIFICANCE OF LYMPH NODE YIELD AND LYMPH NODE RATIO IN CLINICALLY NODE NEGATIVE EARLY ORAL CAVITY SQUAMOUS CELL CARCINOMA.
Nathan Farrokhian, BS, BA[1]; Andrew Holcomb, MD[2]; Erin Dimon[1]; Omar Karadaghy, MD[1]; Christina Ward[1]; Erin Whiteford, MS[2]; Claire Tolan, BA[2]; Elyse K Hanly, MD, PhD[3]; Marisa R Buchakjian, MD, PhD[3]; Brette Harding, MD[4]; Laura Dooley, MD[4]; Justin Shinn, MD[5]; C Burton Wood, MD[5]; Sarah Rohde, MD[5]; Sobia Khaja, MD[6]; Anuraag S Parikh, MD[7]; Mustafa G Bulbul, MD[7]; Mark Varvares, MD[7]; Joseph Penn[1]; Sarah Goodwin[1]; Andres M Bur, MD[1]; [1]Department of Otolaryngology - Head and Neck Surgery, University of Kansas Medical Center; [2]Department of Otolaryngology, Nebraska Methodist Health System; [3]Department of Otolaryngology - Head and Neck Surgery, University of Iowa; [4]Department of Otolaryngology - Head and Neck Surgery, University of Missouri; [5]Department of Otolaryngology - Head and Neck Surgery, Vanderbilt University; [6]Department of Otolaryngology - Head and Neck Surgery, University of Minnesota; [7]Department of Otolaryngology - Head and Neck Surgery, Massachusetts Eye and Ear Infirmary

AHNS23: IMPACT OF CLOSEST MARGIN DISTANCE IN ORAL CAVITY SQUAMOUS CELL CARCINOMA PATIENTS
Wenda Ye, MD[1]; Kevin Guo[2]; Jean-Nicolas Gallant, MD, PhD[1]; Madelyn Stevens, MD[1]; Veerain Gupta[2]; Kayvon Sharif[2]; Vivian Weiss, PhD[3]; Eben Rosenthal, MD[1]; Young Kim, MD, PhD[1]; James Netterville, MD[1]; Kyle Mannion, MD[1]; Alexander Langerman, MD, SM, FACS[1]; Sarah Rohde, MD[1]; Robert Sinard, MD, FACS[1]; Michael Topf, MD[1]; [1]Vanderbilt University Medical Center Department of Otolaryngology - Head and Neck Surgery; [2]Vanderbilt University School of Medicine; [3]Vanderbilt University Medical Center Department of Pathology, Microbiology, and Immunology

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AHNS25: THE IMPACT OF EXTENT OF EXTRANODAL EXTENSION IN ORAL CAVITY SQUAMOUS CELL CARCINOMA: NATIONAL CANCER DATABASE ANALYSIS AND REVIEW OF THE LITERATURE
Brooke Quinton, BS[1]; Claudia Cabrera, MD, MS[2]; Akina Tamaki, MD[2]; Shawn Li, MD[2]; Nicole Fowler, MD[2]; Rod Rezaee, MD[2]; Pierre Lavertu, MD[2]; Theodore Teknos, MD[2]; Quintin Pan, PhD[2]; Jason Thuener, MD[2]; [1]Case Western Reserve University School of Medicine; [2]Department of Otolaryngology-Head & Neck Surgery, University Hospitals Cleveland Medical Center

4:05 pm – 5:00 pm **Landmark B**

Exploring Technological Advances in Skull Base Surgery

Moderator: Shirley Su, MBBS

Trans-orbital skull base surgery - *TBD*

Virtual reality in skull base surgery - *Ivan El-Sayed, MD*

Robotic nasopharyngectomy - *Jimmy Chan, MD*

The session will describe and explore recent technological advances in the following areas: trans-orbital skull base surgery, the role of virtual reality in skull base surgery and education, and advances in robotic skull base surgery.

5:00 pm – 6:00 pm **Landmark A**

AHNS Business Meeting

6:00 pm – 7:00 pm **Landmark B**

Primary Investigator meeting for Clinical Trial NRG-HN006. *AHNS acknowledges support of this non-cme session from Cardinal Health.*

6:00 pm – 7:00 pm **Landmark A**

Fellowship Information Session

THURSDAY, APRIL 28, 2022

8:00 am – 9:00 am **Landmark A**

John Conley Lecture - Equipoise, Ethics, and Evolution of Data: Trials and Tribulations of Treatment Deintensification

Keynote Speaker: Robert Ferris, MD, PhD

9:00 am – 9:45 am **Landmark A**

Oral Abstract Session: Endocrine

Moderators: Michael Singer, MD & Sarah Rohde, MD

AHNS26: THE VALUE OF SECOND OPINIONS ON THYROID NODULE MANAGEMENT PROVIDED VIA DIRECT-TO-CONSUMER TELEMEDICINE SERVICE
Samuel Dudley, MD; Marion B Gillespie, MD; University of Tennessee Health Science Center

AHNS27: IMPACT OF HOSPITAL SAFETY NET BURDEN ON THYROID CANCER SURVIVAL
Megh Shah, BA; Ryan Jin, BA; Christopher C Tseng, BS; Rushi Patel, BA; Dylan F Roden, MD; Richard C Park, MD; Rutgers New Jersey Medical School

AHNS29: UPDATE ON SAFETY AND OUTCOMES OF 300 CONSECUTIVE TRANSORAL THYROIDECTOMY CASES
Danielle R Trakimas, MD, MSE; Christopher Razavi, MD; Khalid Ali, MD; Lena Chen, BS; Ralph P Tufano, MD; Jonathon O Russell, MD; Johns Hopkins Hospital

AHNS30: OPIOID PRESCRIBING IN PATIENTS UNDERGOING NECK DISSECTION FOR THYROID MALIGNANCY
Jennifer March; James Lim; Maisie Shindo; Oregon Health and Science University

AHNS31: PATIENT COMPLIANCE WITH SURVEILLANCE OF THYROID NODULES CLASSIFIED AS ATYPIA OF UNDETERMINED SIGNIFICANCE
Benjamin K Walters, MD; Travis R Newberry, MD; Alex J Mckinlay, MD; San Antonio Military Medical Center

9:00 am – 9:45 am **Landmark B**

Oral Abstract Session: Reconstruction & Complications

Moderators: Marianne Abouyared, MD & Nolan Seim, MD

AHNS32: RISK FACTORS FOR THE DEVELOPMENT OF FISTULA FOLLOWING ORAL CAVITY COMPOSITE RESECTION WITH FREE FLAP RECONSTRUCTION
Jean-Nicolas Gallant[1]; Wenda Ye[1]; Madelyn Stevens[1]; Michael O□Brien[2]; Ansley Kunnath[2]; Siddarth Patel[2]; Margaret Mitchell[3]; Vivian Weiss[1]; Eben Rosenthal[1]; Young Kim[1]; James Netterville[1]; Kyle Mannion[1]; Alexander Langerman[1]; Sarah Rohde[1]; Michael Topf[1]; Robert Sinard[1]; [1]Vanderbilt University Medical Center; [2]Vanderbilt University; [3]Massachusetts Eye and Ear Infirmary

AHNS33: A MULTI-INSTITUTIONAL ANALYSIS OF LATE COMPLICATIONS IN SCAPULA, FIBULA, AND OSTEOCUTANEOUS RADIAL FOREARM FREE FLAPS
Craig A Bollig, MD[1]; Amit Walia, MD[2]; Patrik Pipkorn, MD[2]; Ryan Jackson, MD[2]; Sid Puram, MD, PhD[2]; Jason Rich, MD[2]; Randy Paniello, MD, PhD[2]; Jose P Zevallos, MD, MPH[2]; Madelyn Stevens, MD[3]; C B Wood, MD[4]; Sarah Rhode, MD[3]; Kevin Sykes, MPH, PhD[5]; Kiran Kakarala, MD[5]; Andres Bur, MD[5]; Maggie Wieser[6]; Tabitha Galloway, MD[6]; Patrick Tassone, MD[6]; Pablo Llerena[1]; Tyler Pluchino, MD[7]; Jeffrey Jorgensen, MD[8]; [1]Rutgers Robert Wood Johnson Medical School; [2]Washington University in St. Louis; [3]Vanderbilt University Medical Center; [4]University of Tennessee Health Science Center; [5]University of Kansas Medical Center; [6]University of Missouri School of Medicine; [7]University of Louisville; [8]PRISMA Health

AHNS34: ANALYSIS OF EARLY AND LATE COMPLICATIONS OF MANDIBULECTOMY FREE FLAP RECONSTRUCTION, DOES THE SELECTIVE USE OF SOFT TISSUE ONLY FLAPS REDUCE COMPLICATIONS?
Dylan B McBee, BSA; Caroline C Keehn, BSA; Andrew T Huang, MD; Angela D Haskins, MD; David J Hernandez, MD; Bobby R. Alford Department of Otolaryngology - Head and Neck Surgery, Baylor College of Medicine

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AHNS35: EFFECT OF PERIOPERATIVE ANTITHROMBOTICS AND ANTICOAGULANTS ON POSTOPERATIVE HEMATOMA AND TRANSFUSION RATES IN HEAD AND NECK MICROVASCULAR FREE FLAP PROCEDURES
Melanie D Hicks, MD[1]; Milind Vasudev[2]; Jessica L Bishop, MD[1]; Natalie Garcia[1]; Farshad Chowdhury, MD[3]; Tiffany T Pham, MD, MS[3]; Gabriela Heslop, MD[3]; Julie A Goddard, MD[3]; Tjoson Tjoa, MD[4]; Yarah Haidar, MD[4]; Carissa M Thomas, MD, PhD[1]; [1]University of Alabama at Birmingham; [2]University of California Irvine School of Medicine; [3]University of Colorado; [4]University of California Irvine

AHNS36: IMPACT OF IMPLEMENTING STRICTER CRITERIA FOR BLOOD TRANSFUSION IN PATIENTS WITH HEAD AND NECK CANCER UNDERGOING FREE TISSUE TRANSFER
Osama A Hamdi, MD[1]; Deepa Danan, MD[2]; Brian O Hernandez, MD[3]; Amber Yi, BS[4]; Madisyn Primas, BS[4]; David C Shonka, MD[1]; Jonathan C Garneau, MD[1]; Katherine Fedder, MD[1]; Mark J Jameson, MD[1]; [1]University of Virginia, Department of Otolaryngology - Head and Neck Surgery; [2]University of Florida, Department of Otolaryngology - Head and Neck Surgery; [3]Wake Forest School of Medicine - Otolaryngology; [4]University of Virginia School of Medicine

AHNS37: PERIOPERATIVE COMPLICATIONS IN SCAPULA, FIBULA, AND OSTEOCUTANEOUS RADIAL FOREARM FREE FLAPS: A MULTICENTER STUDY
Craig A Bollig, MD[1]; Amit Walia, MD[2]; Patrik Pipkorn, MD[2]; Ryan Jackson, MD[2]; Sid Puram, MD, PhD[2]; Jason Rich, MD[2]; Randy Paniello, MD, PhD[2]; Jose P Zevallos, MD, MPH[2]; Madelyn Stevens, MD[3]; Sarah Rhode, MD[3]; C B Wood, MD[4]; Tyler Pluchino, MD[5]; Kiran Kakarala, MD[6]; Andres Bur, MD[6]; Kevin Sykes, MPH, PhD[6]; Jairan Sadeghi[1]; Maggie Wieser, BS[7]; Tabitha Galloway, MD[7]; Patrick Tassone, MD[7]; Jeffrey Jorgensen, MD[8]; [1]Rutgers Robert Wood Johnson Medical School; [2]Washington University in St. Louis; [3]Vanderbilt University Medical Center; [4]University of Tennessee Health Science Center; [5]University of Louisville; [6]University of Kansas Medical Center; [7]University of Missouri School of Medicine; [8]PRISMA Health

AHNS38: ELEVATED BMI IS ASSOCIATED WITH INCREASED RATES OF VENOUS THROMBOEMBOLISM IN PATIENTS UNDERGOING HEAD AND NECK FREE FLAP RECONSTRUCTION
Rakan Saadoun[1]; Fuat B Bengur, MD[1]; Elizabeth A Moroni, MD[1]; Johannes A Veit, MD, PhD[2]; Mark Kubik, MD[1]; Mario G Solari[1]; Shaum Sridharan, MD[1]; [1]University of Pittsburgh; [2]University Medical Centre Mannheim

9:45 am – 10:15 am

Break with Exhibitors

10:15 am – 11:15 am **Landmark A**

Review of Historical Perspectives in Pharyngoesophageal Reconstruction

Moderator: Joseph Goodman, MD & Melonie Nance, MD

Local Flap Reconstruction - *Krishnamurthi Sundaram, MD*

Regional Flap Reconstruction - *Ameya Asarkar, MD*

Early Myocutaneous Flap Reconstruction: Firsthand Experience, Historical Learning Points - *Melonie Nance, MD*

Evolution of Free Flaps of Monitoring Techniques - *Alexandra Kejner, MD*

Summary and Conclusion - Melonie Nance, MD

10:15 am – 12:00 pm **Landmark B**

Jatin Shah Symposium: Diagnostic and Therapeutic Advances in HPV-related Oropharyngeal Cancer. *AHNS acknowledges educational grant support of this session from Naveris.*

Moderator: Carole Fakhry, MD

Updates in primary prevention and secondary prevention - *Krystal Lang Kuhs, MD*

Clinical and radiographic biomarkers for risk stratification - *Aarti Bhatia, MD*

Is there a role for oral HPV detection for diagnosis and surveillance - *Jose Zevallos, MD, MPH*

The Use of Plasma CtDNA for surveillance - *Cate Haring, MD*

Recent clinical trials and future directions - *Robert Ferris, MD*

Discussion

11:15 am – 12:00 pm **Landmark A**

Oral Abstract Session: Oropharynx HPV

Moderators: Akina Tamaki, MD & Antoine Eskander, MD

AHNS39: OCCULT NODAL METASTASIS IN SURGICALLY TREATED HPV-RELATED OROPHARYNGEAL SQUAMOUS CELL CARCINOMA
Austin C Cao, BA; Erin R Cohen, MD; Robert M Brody, MD; University of Pennsylvania Department of Otorhinolaryngology- Head and Neck Surgery

AHNS40: DETERMINING THE ROLE OF HPV INTEGRATION IN OROPHARYNGEAL SQUAMOUS CELL CARCINOMA
Wesley H Stepp, MD, PhD; Natalia Isaeva, PhD; Wendell G Yarbrough, MD; Trevor G Hackman, MD; Travis P Schrank, MD, PhD; University of North Carolina at Chapel Hill

AHNS41: FACILITY TYPE PREDICTS TREATMENT REGIMEN FOR HPV-POSITIVE OROPHARYNGEAL SQUAMOUS CELL CARCINOMA
Monica S Trent, MD; Kelsey Roman, BS; Tjoson Tjoa, MD; University of California, Irvine

AHNS42: PREDICTING EXTRANODAL EXTENSION IN EARLY-STAGE HUMAN PAPILLOMA VIRUS-DRIVEN OROPHARYNGEAL CANCER: MACHINE LEARNING USING PET CT AND CLINICAL PARAMETERS.
Thomas D Milner, Dr; Don Wilson, Dr; Patrick Martineau, Dr; Ingrid Bloise, Dr; Carlos Uribe, Mr; Anat Dinur, Dr; Eitan Prisman, Dr; Vancouver General Hospital

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AHNS43: EVOLVING BEYOND THE "UNKNOWN PRIMARY": TRANSORAL SURGERY FACILITATES ROUTINE IDENTIFICATION OF A T1-MICROSCOPIC P16+ OROPHARYNGEAL SCC
F. Christopher Holsinger, Professor Head and Neck Surgery[1]; Michael C Topf, Assistant Professor OHNS[2]; Ryan K Orosco, Assistant Professor OHNS[3]; Andrew C Birkland, Assistant Professor OHNS[4]; Nikita Bedi, Clinical Research Coordinator[1]; A. Dimitrios Colevas, Professor Medical Oncology[1]; Beth M Beadle, Professor Radiation Oncology[1]; [1]Stanford University; [2]Vanderbilt University; [3]University of California at San Diego; [4]University of California at Davis

AHNS44: THE COST IMPLICATIONS OF A PROPOSED MODIFIED SURVEILLANCE STRATEGY TO DETECT DISEASE RECURRENCE IN HPV+ OROPHARYNGEAL CARCINOMA UTILIZING PLASMA CIRCULATING TUMOR HPV DNA: A SINGLE INSTITUTION'S EXPERIENCE.
Michael Lin[1]; Alexander Zhu, MD[2]; Katherine L Fedder, MD[3]; Mark J Jameson, MD, PhD, FACS[3]; Paul Read, MD, PhD[2]; Christopher McLaughlin, MD[2]; Jonathan C Garneau, MD[3]; [1]UVA School of Medicine; [2]UVA Radiation Oncology; [3]UVA Otolaryngology

12:00 pm – 1:00 pm

Lunch with Exhibitors

1:00 pm – 2:45 pm **Landmark A**

Advanced Non-Melanoma Skin Cancer: New Diagnostics, Therapies and Technologies

Considerations for managing the N0 neck for high risk cutaneous squamous cell carcinoma:

Moderator: Shirley Su, MBBS

A role for elective neck dissection - *Marcus Monroe, MD*

Application of Sentinel Lymph node biopsy - *Kevin Emerick, MD*

When to observe - *Natalie Silver, MD*

Lectures: Highlighted Topics: Recent Innovations in the diagnosis and management of advanced non-melanoma skin cancer

Moderator: Karen Choi, MD

Risk stratification by gene expression in cutaneous SCC - *Aviram Mizrachi, MD*

Neoadjuvant immunotherapy for resectable cutaneous SCC - *Neil Gross, MD*

New innovations in facial nerve reconstruction and rehabilitation - *P. Daniel Knott, MD*

Technology and innovation in practice - multidisciplinary case discussions in the management of advanced non-melanoma skin cancer: Multidisciplinary Panel

Moderator: Thomas Ow, MD

HNS - *Jessica Yesensky, MD*

Mohs Surgery - *Anna Bar, MD*

Med Onc - *Jade Homsi, MD*

Rad Onc - *Beth Beadle, MD*

HNS/Plastic Surgery/Reconstruction - *Audrey Baker, MD*

HNS/PRS - *Kelly Malloy, MD*

1:00 pm – 1:30 pm **Landmark B**

Skull Base Cancer Debates: Should I Operate?

Moderator: Ivan El-Sayed, MD

AHNS45: VIRTUAL SURGICAL PLANNING FOR MAXILLARY RECONSTRUCTION WITH THE SCAPULAR FREE FLAP: AN EVALUATION OF A SIMPLE CUTTING GUIDE DESIGN
Khanh Linh Tran; Jae Young Kwon; Xi Yao Gui; James Scott Durham, MD; Eitan Prisman, MD, MA; Division of Otolaryngology, Department of Surgery, Faculty of Medicine, University of British Columbia

AHNS46: PATTERN OF LYMPH NODE METASTASIS OF CUTANEOUS MALIGNANCIES INVOLVING THE TEMPORAL BONE
Justin M Hintze, MD; Holly Jones, MD; Adrien Gendre, MD; Rory McConn Walsh, MD; Neville Shine, MD; James Paul O'Neill, MD; Beaumont Hospital, Dublin, Ireland

AHNS47: THE EFFECTS OF PSYCHOSOCIAL DETERMINANTS ON POSTOPERATIVE COMPLICATIONS OF HEAD AND NECK FREE FLAP PATIENTS
Liyang Tang, MD; Carlos X Castellanos, MS; Daniel Kwon, MD; Niels Kokot, MD; Keck Medicine of USC

AHNS49: CUTANEOUS HEAD & NECK MALIGNANCIES WITH LOW AND HIGH-RISK PERINEURAL INVASION: PATTERNS OF TREATMENT FAILURE & ONCOLOGIC OUTCOMES
Theodore A Gobillot, PhD[1]; Matthew Greer, MD[2]; Upendra Parvathaneni, MD[2]; Zain H Rizvi, MD[1]; [1]Dept. of Otolaryngology-Head & Neck Surgery, University of Washington; [2]Dept. of Radiation-Oncology, University of Washington

AHNS50: IMPACT OF IMMUNOTHERAPY FOR HEAD AND NECK CANCER ON END-OF-LIFE CARE UTILIZATION AND COSTS
William J Benjamin, MPH[1]; Pratyusha Yalamanchi, MD, MPH[1]; Steven B Chinn, MD, MPH[1]; Michelle M Chen, MD, MHS[2]; [1]Department of Otolaryngology - Head and Neck Surgery, University of Michigan; [2]Department of Otolaryngology - Head and Neck Surgery, Cedars Sinai Medical Center

1:30 pm – 2:45 pm **Landmark B**

Joint Speaker with ALA & ARS

Keynote Speaker: Wayne M. Sotile, PhD

Clinical psychologist **Wayne M. Sotile, PhD** is the founder of The Sotile Center for Resilience and the Center for Physician Resilience, in Davidson,

North Carolina. As an international thought leader on physician behavior and resilience for high-performing health professionals, he consults widely with medical group practices, health care systems, and corporations interested in learning evidence-based strategies for deepening collaboration and collegiality and promoting team

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engagement while coping with change.

Dr. Sotile's trail-blazing books, ***The Medical Marriage*** (AMA Press, 2000) and ***The Resilient Physician*** (AMA Press, 2002) were pioneering calls for attending to physician and medical family wellbeing. Has published widely in the peer-reviewed medical literature, including featured articles in JAMA, Journal of Bone and Joint Surgery, Mayo Clinic Proceedings, Journal of the American College of Cardiology, World Neurosurgery, and Clinical OBGYN. His work is featured frequently in the national print and television media, including appearances on "Good Morning America," "Dateline NBC," "CBS This Morning," and more. He has authored or co-authored ten books, including

- ***Thriving in Healthcare: A Guide to Choosing Resilience Over Burnout in Your Busy Life*** (with Gary Simonds, M.D., Huron Studer Group, 2019).
- ***Thriving Physicians: How to Curb Burnout and Choose Resilience Throughout Your Medical Career*** (with Gary Simonds, M.D.; Huron Studer Group, 2018).

Dr. Sotile has delivered more than 8,000 invited addresses and workshops to corporate and medical audiences, including invited presentations to the American Medical Association Leadership Conference, the International Conference on Physician Wellness, VHA Chief Nurses Conference, American Society of Health-System Pharmacists, American Academy of Medical Administrators, and numerous meetings of medical and nursing specialty societies, hospital communities, and corporate audiences. He serves nationally to health systems concerned about provider wellbeing, leader development, and teamwork.

2:45 pm – 3:15 pm

Break with Exhibitors

3:15 pm – 4:05 pm **Landmark A**

Fostering Diversity in Surgery and Overcoming Implicit Bias. *AHNS acknowledges generous educational grant in support of this session from Intuitive Surgical.*

Moderator: Trinitia Cannon, MD

Rethinking Diversity & Inclusion as a Health Dilemma - *Gina Jefferson, MD*

Implicit Bias and Inclusion: How to Get Serious about Inclusion in the Workplace - *Caitlin McMullen, MD*

Why We Need Gender-Neutral Parental Leave Policies - *Rusha Patel, MD*

We will have an open conversation with panelists who have made an impact in diversity and fostering change. The focus will be on discussing ways in which academic medical environments must change in their approach to promoting diversity, equity and inclusion and not just for diversity's sake.

Objectives:

- Recognize the measurable benefits that diversity plays in healthcare
- Define implicit bias and how to address issues of bias quickly and openly
- Implement measures focusing on how inclusion and belonging can change culture and how this can be reimagined
- Discuss the strengths and impact of gender-neutral parental leave policies

3:15 pm – 4:05 pm **Landmark B**

Endocrine I: To Operate is Human, to Ablate is Divine? A Debate About the Ablation of Thyroid Lesions

Introduction to the session - *Michael Singer, MD*

An introduction to Radio Frequency Ablation - *Nishant Agrawal, MD*

Surgery vs. Ablation for thyroid lesions

Benign lesions:

The Pro position - *Ralph Tufano, MD*
The Con position - *Marika Russell, MD*

Microcarcinomas:

The Pro position - *Jon Russell, MD*
The Con position - *Maisie Shindo, MD*

The ablation approach has moved to the current forefront of approaches for benign, and even some small malignant thyroid lesions. Is ablation a fad, a temporizing strategy, or will it replace many open surgical procedures on the thyroid? Following a brief introduction of the technology, endocrine surgery experts will debate the use of ablative technologies on benign thyroid lesions and microcarcinomas.

4:05 pm – 4:55 pm **Landmark A**

Update in Head and Neck Reconstruction: Improving Outcomes with Technology and Innovation. *AHNS acknowledges generous educational grant in support of this session from KLS Martin.*

Moderators: Matthew Old, MD & Jeremy Richmon, MD

Developing a high quality and efficient reconstructive program with lean planning and surgeon models - *Sarah Rohde, MD*

Adding quality and value in head and neck reconstruction with ERAS and pain protocols - *Kiran Kakarala, MD*

Integrating medical modeling, patient specific planning and in-house printing and engineering in head and neck reconstruction - *Kyle VanKoevering, MD*

Quality and value in major head and neck surgery is increasingly a focus due to the high costs and significant complications. The impact of technology and innovation has been critical to assisting teams and patients to increase quality, reduce complications and improve outcomes. This multidisciplinary speaker panel will provide a thought-provoking discussion of different aspects in which innovative technology, protocols, and team-based care provides much needed quality and value in major head and neck surgery.

Objectives:

- Recognize the increasing importance of quality and value in major head and neck surgery, particularly microvascular reconstruction.

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- Understand the different surgical protocols for enhanced peri-operative care and reduced cost and increased quality.
- Integrate novel technology for patient simulation and reconstruction and how this is changing to meet the demands of cost-containment.

4:05 pm – 5:00 pm **Landmark B**

Endocrine II: Can You See What I see? Finding Parathyroids and Autofluorescence

Introduction to the session - *Brendan C. Stack, Jr., MD*

Parathyroid Preservation and the prevention of Hypoparathyroidism - *Brendan C. Stack, Jr., MD*

Which autofluorescence system: Camera vs. probe - *Amanda Silver, MD*

Indocyanine green and parathyroid angiography - *Brooke Su-Velez, MD*

Parathyroid Fluorescence or Autofluorescence: Future Directions - *Julia Noel, MD*

Summary/questions - *Brendan C. Stack, Jr., MD*

The discovery of parathyroid gland autofluorescence was a significant advance in understanding of its physiology. Recently, this phenomenon has been leveraged to improve identification of parathyroid glands intraoperatively and is now clinically available. Parathyroid autofluorescence has been extended to gland protection during primary and revision thyroid surgeries and may be value added in parathyroid directed procedures.

5:00 pm – 6:00 pm **Marsalis Hall**

Poster Session and In-Person Poster Tours

A001: DYSREGULATED EXPRESSION OF HPV RELATED LNCRNA PTENP1 BY SMOKING INDUCES CANCER DRUG RESISTANCE AND RECURRENCE THROUGH C-MYC ACTIVATION
Zixing Liu; Jose Zevallos; Washington University in St Louis, School of Medcine

A002: IN VITRO AND IN VIVO EFFICACY OF ANTIBODY-DRUG CONJUGATE TARGETING HER2 IN HEAD AND NECK SQUAMOUS CELL CARCINOMA
Yu-Jin Lee, MD[1]; Jacqueline Pei[2]; Estelle Martin[1]; Quan Zhou, PhD[1]; Marisa Hom, PhD[3]; Laura Freeman, MD[1]; Guolan Lu[1]; Eben Rosenthal, MD[3]; [1]Stanford University; [2]University of Miami; [3]Vanderbilt University

A004: CHARACTERIZATION OF HUMAN PAPILLOMAVIRUS IN SINONASAL SQUAMOUS CELL CARCINOMA
Elisabeth E Hansen, MSc[1]; Michael Lawrence, PhD[2]; Lisa Mirabello, PhD[3]; James S Lewis, MD[4]; Daniel L Faden, MD[1]; [1]Mass. Eye and Ear, Harvard Medical School; [2]Mass. General Hospital, Harvard Medical School; [3]NCI/NIH; [4]Vanderbilt Medical Center

A005: THE TUMOR IMMUNE LANDSCAPE OF HEAD AND NECK SQUAMOUS CELL CARCINOMA
Chareeni Kurukulasuriya, BS[1]; Honesty Kim, PhD[2]; Alex Trevino, PhD[2]; Blaize D'Anglo[2]; Ryan Preska[2]; Aaron Mayer, PhD[2]; Umamaheswar Duvvuri, MD, PhD[3]; [1]University of Pittsburgh School of Medicine; [2]Enable Medicine; [3]University of Pittsburgh Medical Center

A006: CISPLATIN RESISTANCE IN HEAD AND NECK CANCER: IMPACT OF SECONDHAND SMOKE EXPOSURE
Balaji Sadhasivam, PhD[1]; Jimmy Manyanga, PhD[2]; Vengatesh Ganapathy, PhD[2]; Célia Bouharati, BS[2]; Toral Mehta, PhD[2]; Basil Mathews, MD[2]; Samuel Castles, MD[2]; David Rubenstein, PhD[3]; Alayna Tackett, PhD[4]; Pawan Acharya, MS[5]; Daniel Zhao, PhD[6]; Lurdes Queimado, MD, PhD[7]; [1]Departments of Otolaryngology Head and Neck Surgery, The University of Oklahoma Health Sciences Center; [2]Departments of Otolaryngology Head and Neck Surgery and Cell Biology, The University of Oklahoma Health Sciences Center; [3]Department of Biomedical Engineering, Stony Brook University, New York; [4]Department of Population and Public Health Sciences, Keck School of Medicine, University of Southern California Los Angeles; [5]Department of Biostatistics, The University of Oklahoma Health Sciences Center; [6]Department of Biostatistics and TSET Health Promotion Research Center, Stephenson Cancer Center, The University of Oklahoma Health Sciences Center; [7]Departments of Otolaryngology Head and Neck Surgery, Cell Biology, and TSET Health Promotion Research Center, Stephenson Cancer Center, The University of Oklahoma Health Sciences Center

A007: STANDARDIZED FLUORESCENCE-GUIDED TORS USING AN INTEGRATED SIGNAL SOURCE
Shilpa M Rao, MBBS, MS; Logan D Stone; Hari Jeyarajan, MD; Carissa M Thomas, MD, PhD; Jason M Warram, PhD; University of Alabama at Birmingham

A008: DEEP LEARNING IMPROVES DETECTION OF OROPHARYNGEAL CARCINOMA USING MULTISPECTRAL NARROW-BAND ENDOSCOPIC IMAGING: FINAL RESULTS FROM A PROSPECTIVE CLINICAL STUDY
Chris Holsinger, Professor Head and Neck Surgery; Nikhil V Raghuraman; Julia X Gong; Serena Yeung, Assistant Professor Computer Science; Stanford University

A009: ASSESSING THE IMPACT OF DISCOVERY LEARNING IN A MANDIBLE RECONSTRUCTION SIMULATION MODEL
Kevin Zhao, MD; Kimberly Luu, MD; Khanh Linh Tran; Eitan Prisman, MD, MA; Division of Otolaryngology, Department of Surgery, Faculty of Medicine, University of British Columbia

A010: TRACHEOSTOMY AND LARYNGECTOMY EDUCATION FOR HEALTHCARE PROVIDERS
Renee A Basile, MS, PAC[1]; Lauren LiGreci, MS, CCC, SLP[1]; Diana Bentz[1]; Tristan Tham, MD[2]; Sabreen Bhuiya, BS[3]; Ansley Roche, MD[4]; [1]Staten Island University Hospital; [2]Lenox Hill Hospital; [3]Hofstra; [4]Yale University

A011: ELDERLY HEAD AND NECK CANCER PATIENT PRIORITIES
S A Skillington; S P Gerndt; J T Rich; Washington University School of Medicine in St Louis

A012: TARGETING THE REBELLION: CANCER PREVENTION THROUGH HUMAN PAPILLOMA VIRUS VACCINE EDUCATION OF COLLEGE STUDENTS
Brette C Harding, MD, MS[1]; Danielle Mintzlaff[2]; Tabitha Galloway, MD[1]; [1]University of Missouri - Columbia, Department of Otolaryngology-Head and Neck Surgery; [2]University of Missouri

A013: PREDICTING INTERMEDIATE CARE DISCHARGE FOLLOWING HEAD AND NECK CANCER SURGERY
Deema Almutawa, MD, MPH[1]; Veselko Bakula[2]; Marco Mascarella[1]; Nader Sadeghi[1]; [1]McGill University; [2]Sherbrook

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A014: THE IMPACT OF AN ONCOLOGY NURSE NAVIGATOR ON TREATMENT TIMELINES AND ADHERENCE IN AN UNDERSERVED URBAN POPULATION
Zachary Kelly, MD; Vikas Mehta, MD; Montefiore Medical Center, Department of Otolaryngology

A015: PATIENT AND PROVIDER OUTCOMES BEFORE AND AFTER ENHANCED RECOVERY AFTER SURGERY (ERAS) IMPLEMENTATION FOR HEAD AND NECK FREE FLAP SURGERY
Jake J Lee, MD, MSCI; Ethan J Craig, MD, MPH; Jose P Zevallos, MD, MPH; Randal C Paniello, MD, PhD; Patrik Pipkorn, MD, MSCI; Ryan S Jackson, MD; Sidharth V Puram, MD, PhD; Jason T Rich, MD; Washington University School of Medicine in St. Louis

A016: ADDRESSING THE HEALTH DISPARITIES IN HEAD AND NECK CANCER AMONG BLACK AMERICANS: ASSESSING PERCEPTIONS AND AWARENESS OF THE DISEASE.
Rahilla Tarfa[1]; Jymirah Morris[1]; Vivian Anyaeche[1]; Uduak-Obong Ekanem[2]; BaDoi Phan[1]; Melonie Nance, MD[1]; [1]University of Pittsburgh School of Medicine; [2]Tulane University

A017: EVALUATION OF A TEXT-BASED PEER MENTORSHIP PROGRAM FOR HEAD AND NECK ONCOLOGIC/ MICROVASCULAR SURGEONS
Rusha Patel, MD, FACS[1]; Alexandra Kejner, MD, FACS[2]; Caitlin McMullen, MD[3]; [1]Oklahoma University; [2]University of Kentucky; [3]Moffitt Cancer Center

A018: REGIONALIZATION OF HEAD & NECK ONCOLOGY TUMOR BOARDS: PERSPECTIVES OF COLLABORATING PHYSICIANS
Neha Amin, BS; Kelly Bridgham, BS; Kelly Moyer, MD; Rodney Taylor, MPH, MD; Jeffrey Wolf, MD; Matthew Witek, MD; Jason Molitoris, MD; Ranee Mehra, MD; Kyle Hatten, MD; University of Maryland Medical Center

A019: REPRODUCTIVE FACTORS, OBESITY, AND RISK OF THYROID CANCER AMONG WOMEN: A MULTICENTER RESEARCH NETWORK ANALYSIS
Madison N Hearn, BS; Neerav Goyal, MD, MPH; Tonya King, PhD; David Goldenberg, MD, FACS; Penn State College of Medicine

A020: ANAPLASTIC THYROID CANCER MANAGEMENT AND OUTCOMES: 20-YEAR SINGLE INSTITUTION EXPERIENCE
Shannon S Wu[1]; Eric Lamarre, MD[2]; Anirudh Yalamanchali, MD, MS[2]; Philip Brauer[3]; Chandana A Reddy[2]; Emrullah Yilmaz, MD[2]; Neil Woody, MD[2]; Jamie Ku, MD[2]; Brandon Prendes, MD[2]; Christian Nasr, MD[2]; Mario Skugor, MD[2]; Katherine Heiden, MD[2]; Deborah Chute, MD[2]; Jeffrey Knauf, PhD[4]; Shauna R Campbell, DO[2]; Shlomo Koyfman, MD[2]; Jessica Geiger, MD[2]; Joseph Scharpf, MD[2]; [1]Cleveland Clinic Lerner College of Medicine; [2]Head and Neck Institute, Cleveland Clinic; [3]Case Western Reserve University School of Medicine; [4]Lerner Research Institute, Cleveland Clinic

A021: TRANSORAL ENDOSCOPIC THYROIDECTOMY VIA THE VESTIBULAR APPROACH (TOETVA) IN PATIENTS WITH GRAVES' DISEASE: A NORTH AMERICAN CASE SERIES
Katherine Tai[1]; Sallie Long, MD[1]; Victoria Yu, MD[1]; Rachel Weitzman[1]; Victoria Banuchi, MD[1]; Jonathon Russell, MD[2]; [1]Weill Cornell Medicine Otolaryngology Head and Neck Surgery; [2]Johns Hopkins Otolaryngology-Head and Neck Surgery

A022: RISK STRATIFICATION OF LATERAL NECK RECURRENCE FOR PN1A PAPILLARY THYROID CANCER BASED ON THE NUMBER OF CENTRAL METASTATIC LYMPH NODES AND PRIMARY TUMOR SIZE
Siyuan Xu; Hui Huang; Shaoyan Liu; Jie Liu; Department of Head and Neck Surgical Oncology, National Cancer Center/National Clinical Research Center for Cancer/Cancer Hospital, Chinese Academy of Medical Sciences and Peking Union Medical College

A023: NEOADJUVANT SELECTIVE RET INHIBITOR FOR MEDULLARY THYROID CANCER: A CASE SERIES
Kevin J Contrera, MD, MPH; Maria K Gule-Monroe, MD; Maria E Cabanillas, MD; Mimi I Hu, MD; Naifa L Busaidy, MD; Ramona Dadu, MD; Steven G Waguespack, MD; Jennifer Wang, MD; Jeffery Myers, MD, PhD; Elizabeth G Grubbs, MD; Vivek Subbiah, MD; Michelle D Williams, MD; Mark E Zafereo, MD; UT MD Anderson Cancer Center

A024: SHARED DECISION-MAKING IN THE MANAGEMENT OF INDETERMINATE THYROID NODULES
David Forner, MD, MSc[1]; Victoria Taylor, BA[1]; Christopher W Noel, MD[2]; Brooke Turner, MD[1]; Paul Hong, MD, MSc[1]; Stephanie Johnson-Obaseki, MD, MPH[3]; David P Goldstein, MD, MSc[2]; Matthew H Rigby, MD, MPH[1]; S. Mark Taylor, MD[1]; Jonathan R Trites, MD[1]; Martin Corsten, MD[1]; [1]Dalhousie University; [2]University of Toronto; [3]University of Ottawa

A025: HEALTH CARE DISPARITIES AND RATES OF MALIGNANCY AMONGST CHILDREN WITH SINGLE THYROID NODULES
Z. Jason Qian, MD[1]; Eric Pineda, BS[2]; Hilary Seeley, MD[1]; Gary Hartman, MD[1]; Julia Noel, MD[1]; Lisa A Orloff, MD[1]; Kara D Meister, MD[1]; [1]Stanford University; [2]Tulane University

A026: COMPARISON OF RISK FACTORS AND POSTOPERATIVE OUTCOMES IN PRIMARY AND SECONDARY/TERTIARY HYPERPARATHYROIDISM
Ryan M Kong, BS; Jennifer Liang, MD; Natalya Chernichenko, MD; SUNY Downstate Health Sciences University

A027: FACTORS ASSOCIATED WITH REFUSAL OF SURGERY IN DIFFERENTIATED THYROID CARCINOMA
Aman Prasad, BS[1]; Ryan M Carey, MD[2]; Robert M Brody, MD[2]; Steven B Cannady, MD[2]; Jason G Newman, MD[2]; Jason Brant, MD[2]; Karthik Rajasekaran, MD[2]; [1]Perelman School of Medicine at the University of Pennsylvania; [2]Department of Otorhinolaryngology: Head and Neck Surgery, University of Pennsylvania, Perelman School of Medicine

A028: IMPACT OF NODAL STAGING ON TREATMENT AND SURVIVAL IN MEDULLARY THYROID CANCER
Ryan Jin, BS; Christopher Didzbalis, BS; Kirolos Georges, BA; Salma Ahsanuddin, BS; Richard Chan Woo Park, MD; Department of Otolaryngology-Head & Neck Surgery, Rutgers New Jersey Medical School, Newark, New Jersey, USA

A029: IMPLICATIONS OF EMERGENCY DEPARTMENT PRESENTATION FOR HEAD AND NECK CANCER SURGERY
Alizabeth K Weber, MD; James A Gallogly, MD; Jennifer V Brinkmeier, MD; Sean T Massa, MD, MSCI; Saint Louis University School of Medicine

A030: ASSESSING THE NUTRITIONAL RISK INDEX AS A PREDICTOR OF POSTOPERATIVE COMPLICATIONS IN HEAD AND NECK CANCER SURGERY
Rushi Patel, BA; Vraj P Shah, BS; Prayag Patel, MD; Jean A Eloy, MD, FACS, FARS; Rutgers New Jersey Medical School

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A031: OPIOID PRESCRIBING PATTERNS ACROSS HEAD AND NECK CANCER ONCOLOGY TEAMS AND OTOLARYNGOLOGY PROVIDERS
Neelam Phalke, MD[1]; Christine Settoon, MD[1]; Michael Olejniczak, MD[2]; John N Poche, MD[1]; Delaney Sheehan, MD[3]; Lee McDaniel, PhD[4]; Ashley C Mays, MD[1]; [1]Louisiana State University Otolaryngology; [2]Louisiana State University General Surgery; [3]University of Alabama Otolaryngology; [4]Louisiana State University Department of Public Health

A032: APPLICATION OF FIBRIN SEALANT TO THE TRANSORAL SURGICAL DEFECT SIGNIFICANTLY REDUCES OPIOID USE AND POSTOPERATIVE PAIN
Samantha M Cleveland, MD[1]; Stacey L Tannenbaum, PhD[2]; Crista Horton, MD[2]; Ryan H Sobel, MD[3]; [1]Department of Surgery, Broward Health Medical Center, Fort Lauderdale, Florida, U.S.A; [2]Broward Health Research Institute, Broward Health Medical Center, Fort Lauderdale, Florida, U.S.A; [3]Division of Head & Neck Surgery and Oncology, Department of Surgery, Broward Health Medical Center, Fort Lauderdale, Florida, U.S.A

A033: SURVIVAL IMPROVEMENT IN LOW-INCOME PATIENTS WITH ORAL CAVITY CARCINOMA: A HOSPITAL BASED STUDY
Jobran Mansour, MD[1]; Payam Entezami, MD[1]; Mark Landry, MD[1]; Ameya Asarkar, MD[1]; Farhoud Faraji, MD, PhD[2]; Cherie-Ann Nathan, MD[1]; John Pang, MD[1]; [1]LSU Health Shreveport; [2]UC San Diego Health

A035: IMPACT OF PREOPERATIVE CARE ON CLINICAL OUTCOMES AFTER TOTAL LARYNGECTOMY
Tracy Z Cheng, MD, MHS; Randall Harley, BS; Baraa Nawash, BA; Li Wang, MS; Mohamed Issa, MD; Seungwon Kim, MD; UPMC

A037: MENTAL HEALTH AND QUALITY OF LIFE IN HEAD AND NECK CANCER SURVIVORSHIP
Nicholas R Lenze, MD, MPH[1]; Jeannette T Bensen, MS, PhD[2]; Wendell G Yarbrough, MD, MMHC[2]; Andrew G Shuman, MD[1]; [1]University of Michigan; [2]University of North Carolina

A038: PSYCHOLOGICAL ADJUSTMENT TO ACTIVE SURVEILLANCE VERSUS IMMEDIATE SURGERY FOR LOW-RISK PAPILLARY THYROID CANCER: A PILOT STUDY
Gabriella T Seo, BS[1]; Mark L Urken, MD, FACS, FACE[2]; Lauren E Wein, BA[1]; Michael P Saturno, BA[1]; Monica H Xing, BA[1]; Lauren E Yue, BA[1]; Eric Dowling, MD[2]; Tracey Revenson, PhD[3]; Katherine J Roberts, MPH, MS, EdD[4]; R M Tuttle, MD[5]; [1]Thyroid, Head and Neck Cancer (THANC) Foundation; [2]Department of Otolaryngology-Head and Neck Surgery, Icahn School of Medicine at Mount Sinai; [3]Department of Psychology, The Graduate Center at The City University of New York (CUNY); [4]Department of Health and Behavior Studies, Teachers College, Columbia University; [5]Endocrinology Service-Division of Subspecialty Medicine, Memorial Sloan Kettering Cancer Center

A039: OUTCOMES OF THE FACELIFT INCISIONAL APPROACH IN NECK DISSECTION
Benjamin T Ostrander, MD, MSE; Matthew N Harmon, BS; Vanessa K Yu, BS; Joseph A Califano, MD; University of California San Diego

A040: ORAL TOXICITIES ASSOCIATED WITH IMMUNE CHECKPOINT INHIBITORS: A META ANALYSIS OF CLINICAL TRIALS
Akanksha Srivastava, BDS, MSc, MDSc[1]; Graciela Nogueras Gonzalez, MPH[2]; Yimin Geng, MSLIS, MS[2]; Jeffrey Myers, MD, PhD[2]; Yisheng Li[2]; Aung Naing, MD[2]; Mark S Chambers, DDS, MS[2]; [1]University of Illinois at Chicago; [2]University of Texas MD Anderson Cancer Center

A041: GASTROSTOMY TUBE PLACEMENT AND LONG-TERM QUALITY OF LIFE (QOL) OUTCOMES IN A POPULATION OF UNITED STATES VETERAN OROPHARYNX CANCER PATIENTS COMPARING TRANSORAL ROBOTIC SURGERY (TORS) AND NEOADJUVANT CHEMOTHERAPY AND RADIATION (CRT)
Garren M Low, MD, MS; Nicole Santucci, BS; Rosemarie Mannino, MD; Ravi A Chandra, MD; Daniel Clayburgh; Oregon Health & Science University

A043: PRIMARY FIT TRACHEOESOPHAGEAL PUNCTURE IN PRIMARY VERSUS SALVAGE LARYNGECTOMY: SHORT AND LONG-TERM COMPLICATIONS AND FUNCTIONAL OUTCOMES
Emese Kanyo, BS[1]; Chandana Reddy, PhD[2]; Brian Burkey, MD[2]; Eric Lamarre, MD[2]; Joann Kmiecik, MA, SLP[2]; Joseph Scharpf, MD[2]; Robert Lorenz, MD[2]; Brandon Prendes, MD[2]; Jamie Ku, MD[2]; [1]Cleveland Clinic Lerner College of Medicine; [2]Cleveland Clinic

A044: USE OF WEARABLE ACTIVITY DEVICES TO MONITOR POSTOPERATIVE AMBULATION AND SLEEP AFTER HEAD AND NECK SURGERY
Vivek Pandrangi; Suparna Shan; Jennifer Moy; Daniel Clayburgh; Mark Wax; Peter Andersen; Ryan Li; Oregon Health & Science University

A045: PREDICTING OUTCOMES IN HEAD AND NECK SURGERY WITH MODIFIED FRAILTY INDEX AND SURGICAL APGAR SCORES
Ayham Al Afif[1]; Philip Rosen[2]; Adam Abbas[3]; Timothy Norwood[4]; Lindsay Moore[5]; Jessica Grayson[4]; Kristine Day[4]; Andrew Prince[4]; Benjamin Greene[4]; William Carroll[4]; Sejong Bae[4]; [1]Roswell Park Comprehensive Cancer Center; [2]Indiana University School of Medicine; [3]University at Buffalo; [4]University of Alabama at Birmingham; [5]Stanford University School of Medicine

A046: VELOPHARYNGEAL INSUFFICIENCY AND NASOPHARYNGEAL REFLUX IN IRRADIATED HEAD AND NECK CANCER SURVIVORS
Charles Bradshaw[1]; Ricardo Carrau, MD[2]; Matthew Old, MD[2]; Apoorva Ramaswamy, MD[2]; [1]Ohio State University Eye and Ear Institute; [2]Ohio State University James Cancer Hospital

A048: IMPLEMENTATION OF AN ELECTRONIC REMOTE SYMPTOM MONITORING PLATFORM FOLLOWING HEAD AND NECK SURGERY
Sallie M Long, MD[1]; Michael Hannon, MPA[2]; Siddharth S Kumar, BS[3]; Megan Graham, DNP[4]; Marc A Cohen, MD, MPH[4]; Jennifer R Cracchiolo, MD[4]; [1]NewYork-Presbyterian Hospital/Weill Cornell Medical Center; [2]Patient-Reported Outcomes Center, Department of Surgery, Memorial Sloan Kettering Cancer; [3]Health Informatics, Memorial Sloan Kettering Cancer Center; [4]Head and Neck Service, Department of Surgery, Memorial Sloan Kettering Cancer Center

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A049: THE AREA OF DEPRIVATION INDEX CAN PREDICT THE IMPACT OF NEIGHBORHOOD-LEVEL FACTORS ON DISTRESS AND QUALITY OF LIFE AMONG HEAD AND NECK CANCER SURVIVORS

Lauren A Gardiner, MD[1]; Elizabeth A Moroni, MD, MHA[2]; Zainab Balogun, MS[3]; Jinhong Li, MS[4]; Karley Atchison, MA[1]; Marci L Nilsen, PhD, RN[5]; [1]Department of Otolaryngology Head & Neck Surgery, University of Pittsburgh Medical Center; [2]Department of Plastic and Reconstructive Surgery, University of Pittsburgh Medical Center; [3]University of Pittsburgh School of Medicine; [4]Graduate School of Public Health, University of Pittsburgh; [5]Department of Acute and Tertiary Care, School of Nursing, University of Pittsburgh

A050: THE DEVELOPMENT OF A SCREENING TOOL FOR COMPLICATED LIVING GRIEF IN HEAD AND NECK CANCER PATIENTS

Alexander Karabachev, MD[1]; Kevin Milligan, MD[2]; Colin Cotton, BS[2]; Trisha Wise-Draper, MD, PhD[3]; Chad Zender, MD[1]; Rachael Nolan, PhD[4]; [1]University of Cincinnati Department of Otolaryngology Head and Neck Surgery; [2]University of Cincinnati College of Medicine; [3]University of Cincinnati Cancer Center; [4]University of Cincinnati Public Health Sciences Division

A068: CHARACTERIZING TRIGGERS FOR THYROID ULTRASOUND REFERRALS

Kathy Bach, BA[1]; Yanchen Zhang, MD[2]; Christie F Cheng, BA[1]; Abdullah A Adil, BS[1]; Yazeed Qadadha, BS[1]; David T Smith, BA[1]; Vivian Hsiao, MD[3]; Lori Mankowski-Gettle, MD, MBA[4]; Sara Fernandes-Taylor, PhD[5]; Natalia A Arroyo, MPH[5]; David O Francis, MD, MS[2]; [1]University of Wisconsin School of Medicine and Public Health, Madison, Wisconsin; [2]Division of Otolaryngology, Department of Surgery, University of Wisconsin-Madison, Madison, Wisconsin; [3]Department of Surgery, University of Wisconsin-Madison, Madison, Wisconsin; [4]Department of Radiology, University of Wisconsin-Madison, Madison, Wisconsin; [5]Department of Surgery, Wisconsin Surgical Outcomes Research Program, University of Wisconsin-Madison, Madison, Wisconsin

A069: Visualization of sentinel lymph node with a novel fluorescent tagged radiotracer in head and neck surgery

Sophie S Jang, MD; Christopher Barback; Ryotaro Ogawa, MD, PhD; Theresa Guo, MD; David Vera, MD; University of California San Diego

A070: INTRAOPERATIVE MARGIN DETECTION OF HEAD AND NECK CANCER WITH DYNAMIC OPTICAL CONTRAST IMAGING: AN IN VIVO MURINE MODEL

Kenric Tam, MD[1]; Yazeed Alhiyari, PhD[1]; Shan Huang[1]; Oscar Stafsudd, PhD[2]; Ramesh Shori, PhD[2]; Maie St. John, MD, PhD[1]; [1]UCLA Department of Head and Neck Surgery; [2]UCLA Department of Electrical and Computer Engineering

A071: SURGEON REVIEW OF 4D CT FOR IDENTIFICATION OF PARATHYROID ADENOMAS

Zoe A Roecker, BSE; Osama Hamdi, MD; Simone A Barker, MD; Andrew Strumpf, MPH; Jonathan C Garneau, MD; David C Shonka, MD; University of Virginia

A072: IN VIVO FLUORESCENCE LIFETIME IMAGING IN HEAD & NECK SURGICAL ONCOLOGY: A 92-PATIENT STUDY DEMONSTRATING THE DETECTION OF SQUAMOUS CELL CARCINOMA AND CONFIRMATION OF NEGATIVE MARGINS

Brent W Weyers, BS[1]; Julien Bec, PhD[1]; Mohamed A Hassan, PhD[1]; Athena K Tam, BS[1]; Dorina Gui, MD, PhD[2]; Andrew C Birkeland, MD[3]; Arnaud F Bewley, MD[3]; Marianne Abouyared, MD[3]; Laura Marcu, PhD[4]; D. Gregory Farwell, MD, FACS[5]; [1]University of California, Davis - Department of Biomedical Engineering; [2]University of California, Davis - Department of Pathology and Laboratory Medicine; [3]University of California, Davis - Department of Otolaryngology - Head & Neck Surgery; [4]University of California, Davis Departments of Biomedical Engineering and Neurological Surgery; [5]University of Pennsylvania - Department of Otorhinolaryngology - Head and Neck Surgery

A073: IDENTIFYING INTERPRETABLE RADIOGRAPHIC BIOMARKERS IN MACHINE LEARNING MODELS TO PREDICT OUTCOMES IN OROPHARYNGEAL CARCINOMA.

Yinzhu Chen, BS[1]; Preston T Fletcher, PhD[1]; Jeffrey Mella, MD[2]; Jonathan C Garneau, MD[2]; [1]University of Virginia, Computer Engineering Dept; [2]University of Virginia, Otolaryngology-HNS Dept

A074: IMMUNE DYNAMICS IN RESPONSE TO PD-1 BLOCKADE IN MURINE ORAL CAVITY CANCER

Katherine C Wai, MD; Lauren S Levine, MD; Iliana Tenvooren, MS; Patrick K Ha, MD; Mekhail Anwar, MD, PhD; Matthew H Spitzer, PhD; University of California San Francisco

A075: BLOOD EOSINOPHIL COUNT MAY PREDICT SEVERE IMMUNE-RELATED ADVERSE EVENTS DUE TO NIVOLUMAB IN RECURRENT OR METASTATIC HEAD AND NECK SQUAMOUS CELL CARCINOMA

Yushi Ueki, MD, PhD; Takeshi Takahashi, MD; Ryusuke Shodo, MD, PhD; Keisuke Yamazaki, MD, PhD; Arata Horii, MD, PhD; Department of Otolaryngology Head and Neck Surgery Niigata University Faculty of Medicine

A077: REAL WORLD OUTCOMES IN PATIENTS WITH HNSCC TREATED WITH CHECKPOINT INHIBITION

Sara B Hobday[1]; Robert M Brody, MD[1]; Barry A Kriegsman, MD, PhD[1]; Devraj Basu, MD, PhD, FACS[2]; Jason Newman, MD, FACS[1]; Roger B Cohen, MD[3]; Abigail Doucette[4]; Lova Sun, MD, MSCE[5]; [1]Department of Otorhinolaryngology: Head and Neck Surgery, Perelman School of Medicine, University of Pennsylvania, Philadelphia, PA; [2]Department of Otorhinolaryngology: Head and Neck Surgery, Perelman School of Medicine, University of Pennsylvania, The Wistar Institute, Philadelphia, PA; [3]Abramson Cancer Center of the University of Pennsylvania, Philadelphia PA; [4]Department of Radiation Oncology, Perelman School of Medicine at the University of Pennsylvania, Philadelphia PA; [5]Division of Hematology/Oncology, Department of Medicine, University of Pennsylvania, Philadelphia, PA

A078: RACIAL REPRESENTATION IN CLINICAL TRIALS OF IMMUNE CHECKPOINT INHIBITORS IN HEAD AND NECK CANCER

Grace M Amadio, BS[1]; Anita Sulibhavi, MD[2]; Olivia Given Costello, MLIS[3]; Jeffrey C Liu, MD[2]; [1]Lewis Katz School of Medicine at Temple University; [2]Department of Otolaryngology, Head and Neck Surgery, Temple University, Philadelphia, PA; [3]Charles Library, Temple University

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A079: COMPUTATIONAL AND IN VITRO EVALUATION OF SHARED IMMUNOGENIC NEOANTIGENS IN ADENOID CYSTIC CARCINOMA
James A Cevallos, MS[1]; Catherine Y Han, BS[2]; Fengshen Kuo, PhD[3]; Jingming Wang, PhD[3]; Zaineb Nadeem, MS[3]; Patrick Ha, MD[1]; Luc Morris, MD, MSc[3]; [1]UCSF; [2]Weill Cornell Medicine; [3]Memorial Sloan Kettering Cancer Center

A080: ONCOLOGIC QUALITY METRICS IN PATIENTS WITH OPERABLE MUCOSAL HEAD AND NECK SQUAMOUS CELL CARCINOMA ENROLLED IN NEOADJUVANT TARGETED THERAPY TRIALS
Marco A Mascarella, MD; Varun Vendra; Mark W Kubik; Shaum Sridharan; Seungwon Kim; Robert L Ferris; Moon J Fenton; James P Ohr; Dan P Zandberg; Umamaheswar Duvvuri; University of Pittsburgh Medical Center

A081: PATTERNS OF DISEASE IN PATIENTS WITH MULTIPLE PARAGANGLIOMAS WITH AN SDH MUTATION
Hilary C McCrary, MD, MPH[1]; Mitch Dunklebarger, MD[1]; Anne Naumer, MS[2]; Samantha Greenberg, MS, MPH[2]; Neil Patel, MD[1]; Luke O Buchmann, MD[1]; [1]University of Utah School of Medicine, Division of Otolaryngology - Head and Neck Surgery; [2]University of Utah, Genetic Counseling at the Huntsman Cancer Institute

A082: OUTCOMES IN SINONASAL ADENOCARCINOMA: A SINGLE INSTITUTION EXPERIENCE
Elliot Morse, MD, MHS; Dauren Adilbay; Cristina Valero, MD; Ximena Mimica, MD; Piyush Gupta, MD; Jennifer Cracchiolo, MD; Snehal Patel, MD; Jatin Shah, MD; Ian Ganly*, MD, PhD; Marc Cohen*, MD, MHS; Memorial Sloan Kettering Cancer Center

A084: ORAL TONGUE SQUAMOUS CELL CARCINOMA IN YOUNG PATIENTS: A 21 YEAR EXPERIENCE
Krishna K Bommakanti; Albert Y Han; Shreya Mathur; Maie A St. John; UCLA

A085: WHEN MORE IS LESS: SHORTCOMINGS OF EXCISIONAL BIOPSY IN EARLY-STAGE ORAL CAVITY CARCINOMA
Rodolfo E Manosalva, MD[1]; Andrew J Holcomb, MD[2]; Dominique Pataroque, BA[1]; John Gentry, MD[2]; Darby Keirns, BS[1]; [1]Creighton University School of Medicine; [2]Methodist Estabrook Cancer Center

A086: RELATIONSHIP BETWEEN AMBIENT AIR POLLUTION AND INCIDENCE OF HEAD AND NECK CANCERS IN ILLINOIS
Tirth R Patel, MD, MS[1]; Pedro D Escobedo, BS[1]; Samer Al-Khudari, MD[1]; Kerstin M Stenson, MD, FACS[1]; Jayant M Pinto, MD[2]; Mihir K Bhayani, MD[1]; [1]Rush University Medical Center; [2]University of Chicago

A087: ASSOCIATION OF THE GERIATRIC NUTRITIONAL RISK INDEX AND POSTOPERATIVE COMPLICATIONS IN HEAD AND NECK CANCER
Joy Chen, BS; Marianne Abouyared, MD; University of California, Davis

A088: PREDICTING PROGRESSION OF ORAL DYSPLASIA TO MALIGNANCY USING MACHINE LEARNING
Michael P Wu, MD; Matthew Crowson, MD; Mark Varvares, MD; Massachusetts Eye and Ear

A089: UTILITY OF FROZEN SECTION MARGINS IN ORAL CAVITY SQUAMOUS CELL CARCINOMA
Sallie Long, MD[1]; Timothy Mclean, MBBS[2]; Cristina Valero Mayor, MD, PhD[2]; Conall W Fitzgerald, MB, MSc[2]; Nora Katabi, MD[3]; Bin Xu, MD, PhD[3]; Marc A Cohen, MD, MPH[2]; Ian Ganly, MD, PhD[2]; Ronald A Ghossein, MD[3]; Snehal G Patel, MD[3]; [1]NewYork-Presbyterian Hospital/Weill Cornell and Columbia; [2]Department of Surgery, Head and Neck Service, Memorial Sloan Kettering Cancer Center; [3]Head and Neck Pathology, Memorial Sloan Kettering Cancer Center

A090: THE ROLE OF LYMPHOVASCULAR INVASION IN THE PROGNOSIS OF ORAL CAVITY SQUAMOUS CELL CARCINOMA
Abigail E Moore, BS[1]; Sameer A Alvi, MD[2]; Osama Tarabichi, MD[2]; Vivian L Zhu, MD[2]; Marisa Buchakjian, MD, PhD[2]; [1]University of Iowa Carver College of Medicine; [2]University of Iowa, Department of Otolaryngology - Head & Neck Surgery

A091: USE OF MACHINE LEARNING TO DEVELOP A CLINICAL PREDICTION MODEL FOR RECURRENCE IN EARLY ORAL CANCER
Omar A Karadaghy, MD, MSCI[1]; Nathan Farrokhian[1]; Andrew Holcomb, MD[2]; Erin Dimon[1]; Christina Ward[1]; Erin Whiteford, MS[2]; Claire Tolan, BA[2]; Elyse Hanley, MD[3]; Marisa Buchakjian, MD, PhD[3]; Brette Harding, MD[4]; Laura Dooley, MD[4]; Justin Shinn, MD[5]; C. Burton Wood, MD[5]; Sobia Khaja, MD[6]; Anuraag Parikh, MD[7]; Mustafa Bulbul, MD[7]; Mark Varvares[7]; Joseph Penn[1]; Sarah Goodwin[1]; Andres Bur, MD[1]; [1]University of Kansas Medical Center; [2]Nebraska Methodist Health System; [3]University of Iowa; [4]University of Missouri, Columbia; [5]Vanderbilt University; [6]University of Minnesota; [7]Massachusetts Eye and Ear Infirmary, Harvard

A092: PROGNOSTIC VALUE AND CLINICOPATHOLOGICAL STATUS OF PDL-1 EXPRESSION AND CD8+ TILS IN ORAL SQUAMOUS CELL CANCER PATIENTS WITH OR WITHOUT TRADITIONAL RISK
Warut Pongsapich, MD; Thanion Soopanit, MD; Natthawadee Laokulrath, MD; Veeruth Chayopasakul, MD; Mahidol university

A093: SURVIVORSHIP OF ORAL CANCER BY SUBSITE DIFFERS IN YOUNG VERSUS OLD PATIENTS
Connie J Zhou, BS[1]; Neil N Patel, MD[2]; Ivan H El-Sayed, MD[2]; Jonathan R George, MD[2]; Chase M Heaton, MD[2]; William R Ryan, MD[2]; Patrick K Ha, MD[2]; [1]University of California, School of Medicine; [2]University of California San Francisco, Department of Otolaryngology-Head and Neck Surgery

A094: USING MACHINE LEARNING TO PREDICT DISEASE FREE-SURVIVAL IN ORAL CAVITY CANCER
Alexandra T Bourdillon, BS[1]; Hemali P Shah, BS[1]; Michael A Hajek, MD[2]; Oded Cohen, MD[2]; Saral Mehra, MD, MBA, FACS[2]; [1]Yale School of Medicine; [2]Department of Surgery, Division of Otolaryngology, Yale School of Medicine

A095: MULTIFUNCTIONAL TARGETED NANO-SCAFFOLD FOR TREATMENT OF CHEMOTHERAPY INDUCED ORAL MUCOSITIS
Inbal Hazkani, MD[1]; Marina Sokolsy-Papkov, PhD[2]; Khushmi Shah[2]; Isaiah Kim[2]; Alexander Kabanov, PhD[2]; Andrew Wang, MD[2]; [1]Ann & Robert H. Lurie Children's Hospital of Chicago; [2]University of North Carolina, Eshelman School of Pharmacy

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A096: IMPLEMENTATION OF MACHINE LEARNING CLASSIFIERS TO PREDICT 5-YEAR OVERALL SURVIVAL FOR ORAL CAVITY CANCER USING NCDB
Alexandra T Bourdillon, BS[1]; Hemali P Shah, BS[1]; Matthew J Swanson, BS[2]; Michael A Hajek, MD[3]; Oded Cohen, MD[3]; Saral Mehra, MD, MBA, FACS[3]; [1]Yale School of Medicine; [2]Frank H Netter MD School of Medicine at Quinnipiac University; [3]Department of Surgery, Division of Otolaryngology, Yale School of Medicine

A097: TORS WITH NECK DISSECTION VERSUS PRIMARY NON-SURGICAL TREATMENT IN STAGE I AND II HPV-NEGATIVE OROPHARYNGEAL CANCER
Brian Morris, MD[1]; Craig A Bollig, MD[2]; [1]Penn State College of Medicine; [2]Rutgers Robert Wood Johnson Medical School

A098: DETERMINANTS OF PATIENT-REPORTED TASTE PROBLEMS IN OROPHARYNGEAL CANCER SURVIVORS
Christopher W Ogboe, OD[1]; Puja Aggarwal, PhD, BDS, MPH[1]; Adam S Garden, MD[2]; Frank E Mott, MD, FACP[3]; Ryan P Goepfert, MD[4]; Ruth A Aponte Wesson, DDS, MS, FACP, FAAMP[4]; Ann M Gillenwater, MD[4]; Mayur Patel, BSA, MS, IV[5]; Clifton D Fuller, MD, PhD[2]; Stephen Y Lai, MD, PhD[4]; G. Brandon Gunn, MD[2]; Mark S Chambers, DMD, MS[4]; Erich M Sturgis, MD, MPH[5]; Ehab Y Hanna, MD[4]; Katherine A Hutcheson, PhD[4]; Sanjay Shete, PhD[1]; [1]Department of Epidemiology, The University of Texas M.D Anderson Cancer Center; [2]Department of Radiation Oncology, The University of Texas M.D Anderson Cancer Center; [3]Department of Thoracic Head and Neck Medical Oncology, The University of Texas M.D Anderson Cancer Center; [4]Department of Head and Neck Surgery, The University of Texas M.D Anderson Cancer Center; [5]The University of Texas Health Science Center at Houston; McGovern Medical School

A099: DIFFERENCES IN SURVIVAL OF OROPHARYNGEAL SQUAMOUS CELL CARCINOMA BY SUBSITE AND HPV STATUS
Shreya Chidarala, BS; Michael C Shih, BS; Michael Bobian, MD; Lindsey Shehee, MD; Alana Aylward, MD; John Kaczmar, MD; Anand K Sharma, MD; Shaun A Nguyen, MD; Terry A Day, MD; Medical University of South Carolina

A100: HPV IN THE CERVIX AND OROPHARYNX: ASSESSING THE PREVALENCE OF GYNECOLOGIC CANCER AND PRECANCEROUS LESIONS IN WOMEN WITH OROPHARYNEAL CANCER
Austin C Cao, BA; Erin R Cohen, MD; Robert M Brody, MD; University of Pennsylvania Department of Otorhinolaryngology-Head and Neck Surgery

A101: EVALUATING PREDICTORS OF FINANCIAL TOXICITY IN HEAD AND NECK CANCER PATIENTS TREATED WITH TRANSORAL ROBOTIC SURGERY
Austin C Cao, BA; Evan Cretney, MD; Leila J Mady, MD, PhD, MPH; Jason G Newman, MD; Ara C Chalian, MD; Karthik Rajasekaran, MD; Steven B Cannady, MD; Devraj Basu, MD, PhD; Gregory S Weinstein, MD; Robert M Brody, MD; University of Pennsylvania Department of Otorhinolaryngology- Head and Neck Surgery

A102: TREATMENT TRENDS AMONG HEAD AND NECK SQUAMOUS CELL CARCINOMA IN THE UNITED STATES
Melina J Windon, MD[1]; Eleni M Rettig, MD[2]; Carole Fakhry, Professor[1]; [1]Johns Hopkins University SOM; [2]Brigham and Women's Hospital

A103: VALIDATION OF AJCC-8 FOR OROPHARYNGEAL SQUAMOUS CELL CARCINOMA IN APPALACHIANS WITH MULTIPLE CONFOUNDERS
Clayton Burruss, BS[1]; Christine Sharrer, MS[1]; J. Zachary Porterfield, MD, PhD[2]; Alexandra E Kejner, MD[2]; [1]University of Kentucky College of Medicine; [2]University of Kentucky Department of Otolaryngology - Head and Neck Surgery

A104: SURGERY FOR THE TREATMENT OF HPV-NEGATIVE SQUAMOUS CELL CARCINOMA OF THE OROPHARYNX - A SYSTEMATIC REVIEW AND META-ANALYSIS.
Erica H McArdle, MD[1]; Mustafa G Bulbul, MD, MPH[1]; Chantz Collins, BS[2]; Umamaheswar Duvvuri, MD, PhD[3]; Neil Gross, MD, FACS[4]; Meghan T Turner, MD[1]; [1]Department of Otolaryngology-Head and Neck Surgery, West Virginia University School of Medicine; [2]West Virginia University; [3]Department of Otolaryngology-Head and Neck Surgery, University of Pittsburgh; [4]Department of Otolaryngology-Head and Neck Surgery, University of Texas, MD Anderson Cancer Center

A105: INTERDISCIPLINARY WORKSHOP THAT IMPROVES HPV-MEDIATED OROPHARYNGEAL CANCER KNOWLEDGE AMONG PRIMARY CARE RESIDENTS
Shaghauyegh S Azar, BS[1]; Lauran K Evans, MD, MPH[2]; Brooke M Su-Velez, MD, MPH[3]; Maie A St. John, MD, PhD[2]; [1]David Geffen School of Medicine at UCLA; [2]Department of Head and Neck Surgery, University of California Los Angeles; [3]Department of Otolaryngology - Head and Neck Surgery, Stanford University

A106: IMPROVING MARGIN ASSESSMENT DURING TRANSORAL ROBOTIC SURGERY FOR P16+ OROPHARYNGEAL SQUAMOUS CELL CARCINOMA WITH UTILIZATION OF INTRAOPERATIVE POSITIVE CONTROLS
Alice C Yu, BA[1]; Jeffrey D Goldstein, MD[2]; Elliot Abemayor, MD, PhD[1]; Abie H Mendelsohn, MD[1]; [1]Department of Head and Neck Surgery, University of California Los Angeles; [2]Department of Pathology, University of California Los Angeles

A107: AIRWAY PROTECTION AND OUTCOMES AFTER STAGED VERSUS CONCURRENT BILATERAL NECK DISSECTIONS WITH TRANSORAL BASE OF TONGUE CANCER RESECTION
Jake J Lee, MD, MSCI; Nicholas A Rapoport, BS; Patrik Pipkorn, MD, MSCI; Sidharth V Puram, MD, PhD; Ryan S Jackson, MD, PhD; Washington University School of Medicine in St. Louis

A109: CLINICO-DEMOGRAPHIC RISK FACTORS OF PATIENT-REPORTED DYSPHAGIA AMONG LONG-TERM OROPHARYNGEAL CANCER SURVIVORS
Camille R Charles, BS[1]; Puja Aggarwal, PhD, BDS, MPH[1]; Adam S Garden, MD[2]; Frank E Mott, MD, FACP[3]; Charles Lu, MD, SM[3]; Ryan P Goepfert, MD[4]; Mayur Patel, BSA, MS, IV[5]; Clifton D Fuller, MD, PhD[2]; Stephen Y Lai, MD, PhD[4]; G. Brandon Gunn, MD[2]; Mark S Chambers, DMD, MS[4]; Erich M Sturgis, MD, MPH[6]; Ehab Y Hanna, MD[4]; Sanjay Shete, PhD[1,7,8]; Katherine A Hutcheson, PhD[2,4]; [1]Department of Epidemiology, The University of Texas MD Anderson Cancer Center; [2]Department of Radiation Oncology, The University of Texas MD Anderson Cancer Center; [3]Department of Thoracic Head and Neck Medical Oncology, The University of Texas MD Anderson Cancer Center; [4]Department of Head and Neck Surgery, The University of Texas MD Anderson Cancer Center; [5]The University of Texas Health Science Center at Houston, McGovern Medical School; [6]Department of Otolaryngology-Head and Neck Surgery, Baylor College of Medicine; [7]Department of Biostatistics, The University of Texas MD Anderson Cancer Center; [8]Division of Cancer Prevention and Population Sciences, The University of Texas MD Anderson Cancer Center

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A110: PROSPECTIVE PATIENT-REPORTED QUALITY OF LIFE OUTCOMES FOR HUMAN PAPILLOMAVIRUS ASSOCIATED OROPHARYNX CANCER TREATED WITH TRANSORAL ROBOTIC SURGERY AND NECK DISSECTION ALONE
Sagar Kansara, MD[1]; Karolina Plonowska-Hirschfeld, MD[1]; Arushi Gulati[1]; Mary Xu, MD[2]; Aaron Zebolsky[1]; Edgar Ochoa, MD[1]; Patrick Ha, MD[1]; Chase Heaton, MD[1]; Yue Ma, MD[1]; William R Ryan, MD[1]; [1]UCSF; [2]University of Pennsylvania

A111: DO PATIENTS REGRET TRANSORAL ROBOTIC SURGERY FOR OROPHARYNGEAL CANCER?
Jae Young Kwon; Alice Liu, MD; Thomas D Milner, MD; Eitan Prisman, MD, FRCSC; Division of Otolaryngology, Department of Surgery, Faculty of Medicine, University of British Columbia, Canada

A112: TRANSCERVICAL ARTERIAL LIGATION FOR ALL-COMERS IN TRANSORAL ROBOTIC SURGERY FOR OROPHARYNGEAL SQUAMOUS CELL CARCINOMA: A BLEED-RATE AND VESSEL ANALYSIS
Kelly E Daniels, MD; Mark Kubik, MD; Seungwon Kim, MD; Robert L Ferris, MD, PhD; Umamaheswar Duvvuri, MD, PhD; University of Pittsburgh Medical Center - Pittsburgh

A113: INCIDENCE OF LEVEL IV METASTASIS IN SURGICAL TREATED HUMAN PAPILLOMAVIRUS OROPHARYNGEAL SQUAMOUS CELL CARCINOMA
Lauren E Miller; Vivienne H Au; Shanmugappiriya Sivarajah; Derrick T Lin; Daniel G Deschler; Mark A Varvares; Kevin S Emerick; Daniel L Faden; Allen L Feng; Jeremy D Richmon; Massachusetts Eye and Ear Infirmary

A114: OUTCOMES OF RETROPHARYNGEAL LYMPH NODE DISSECTION IN HPV-ASSOCIATED OROPHARYNGEAL SQUAMOUS CELL CARCINOMA PATIENTS TREATED WITH TRANS-ORAL ROBOTIC SURGERY
Austin C Cao, BA[1]; Garrett Largoza, BS[2]; Jason G Newman, MD[1]; Karthik Rajasekaran, MD[1]; Steven B Cannady, MD[1]; Devraj Basu, MD, PhD[1]; Ara A Chalian, MD[1]; Gregory S Weinstein, MD[1]; Bert W O'Malley, MD[1]; Robert M Brody, MD[1]; Christopher H Rassekh, MD[1]; [1]University of Pennsylvania Department of Otorhinolaryngology- Head and Neck Surgery; [2]Thomas Jefferson University, Sidney Kimmel Medical College

A115: EFFECTS OF OROPHARYNGEAL CANCER EDUCATION ON PEDIATRICS RESIDENTS' HUMAN PAPILLOMAVIRUS VACCINATION PRACTICES
Annmarie I Mede, BA[1]; Patrick Tassone, MD[2]; Sarah Rohde, MD[3]; Michael Topf[3]; [1]Vanderbilt University School of Medicine; [2]Department of Otolaryngology-Head and Neck Surgery, University of Missouri; [3]Department of Otolaryngology-Head and Neck Surgery, Vanderbilt University

A116: PRETREATMENT CIRCULATING TUMOR HPV DNA LEVEL IS ASSOCIATED WITH NODAL DISEASE BURDEN, HPV GENOTYPE, AND LYMPHOVASCULAR INVASION AMONG PATIENTS WITH HPV-ASSOCIATED OROPHARYNX CARCINOMA
Annette A Wang, MS[1]; Glenn J Hanna, MD[2]; Evan Carey[2]; Eleni M Rettig, MD[3]; [1]Harvard Medical School; [2]Dana-Farber Cancer Institute; [3]Brigham and Women's Hospital Otolaryngology-Head and Neck Surgery

A117: INNATE IMMUNITY BIOMARKERS IN HEAD AND NECK CANCER: AN INTEGRATED ANALYSIS OF THE MRNA TRANSCRIPTOME
Katie K Spielbauer, MD; Chitra Subramanian, PhD, MBA; Reid McCallister; Mark Cohen; Michigan Medicine

A118: IMPACT OF TARGETED THERAPY IN ANAPLASTIC THYROID CARCINOMA
Eric A Krause, BS; Brette C Harding, MD; Richard D Hammer, MD; Laura M Dooley, MD; University of Missouri

A119: SAFE EXCLUSION OF TRACHEOSTOMIES IN FREE TISSUE TRANSFERS FOR HEAD AND NECK RECONSTRUCTIONS
Alice Q Liu, MD; Kevin Zhao, MD; Emily C Deane, MD; Sally Nguyen, MD, FRCSC; Jamie Kwon; Donald W Anderson, MD, FRCSC; J. Scott Durham, MD, FRCSC; Eitan Prisman, MD, FRCSC; University of British Columbia

A120: EVALUATION OF GAMMATILES FOR DELIVERY OF CS-131 IN HEAD AND NECK CANCER
Aarti Agarwal, MD; Bryan Renslo, BS; Reza Taleei, PhD; Joseph Pinto, MS; Voichita Bar-Ad, MD; Adam Luginbuhl, MD; Thomas Jefferson University Hospital

A121: PECTORALIS MAJOR OSTEOMYOCUTANEOUS FLAP FOR MANDIBULAR RECONSTRUCTION: A CASE SERIES
Ryan N Hellums; Priscilla F Pichardo; Nicholas C Purdy; Geisinger Health System

A122: MANAGEMENT OF FREE FLAP FAILURE IN HEAD AND NECK SURGERY
Ethan J Craig, MD, MPH; Amit Walia, MD; Kwasi Enin; Ryan Jackson, MD; Sid Puram, MD, PhD; Patrik Pipkorn, MD, MSCI; Washington University in Saint Louis

A123: FACTORS IMPACTING DISCHARGE DESTINATION FOLLOWING MICROVASCULAR RECONSTRUCTION
Larissa Sweeny[1]; Allison Slijepcevic, MD[2]; Ashley Kraft[1]; Joseph Curry[3]; Ramez Philips[3]; Kelsie Guice[1]; Caroline Bonaventure[1]; Adam Luginbuhl[3]; Meghan Crawley[3]; Eleanor McCreary[2]; Michelle Bunke[2]; Mark K Wax[2]; [1]LSU-HSC, New Orleans; [2]OHSU; [3]TJU

A124: ASSOCIATION OF ASPIRIN RESISTANCE WITH WOUND HEALING COMPLICATIONS IN HEAD AND NECK FREE TISSUE TRANSFER
Danielle E Scarola, MD[1]; Hannah Moriarty, MD[2]; Cheryl Maier, MD[2]; H. Michael Baddour, MD[2]; [1]Case Western/University Hospitals Cleveland; [2]Emory University

A125: EMPLOYMENT OF "PROPHYLACTIC" TRACHEOSTOMY IN FREE-FLAP RECONSTRUCTIVE SURGERY OF THE HEAD AND NECK
Hannah J Brown, BS[1]; Hannah N Kuhar, MD[2]; Ashley Heilingoetter, MD, MPH[2]; Samer Al-Khudari, MD[3]; Peter C Revenaugh, MD[3]; Kerstin Stenson, MD[3]; [1]Rush Medical College of Rush University; [2]Ohio State University; [3]Rush University Medical Center

A126: UTILITY OF THE SALIVARY BYPASS TUBE FOR PREVENTION OF STENOSIS AND FISTULA AFTER TOTAL PHARYNGECTOMY
Sullivan Smith, MD[1]; Yunmin Lee, BA[2]; Richard Borrowdale, MD[1]; Eric Thorpe, MD, MBA, FACS[1]; Amy L Pittman, MD[1]; [1]Loyola University Medical Center; [2]Loyola University Stritch School of Medicine

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A127: EFFICIENCY IN HEAD AND NECK FREE FLAP SURGERY: ASSESSMENT AND IMPACT OF BOTTLENECKS IN THE PERIOPERATIVE WORKFLOW
Andrew Prince, MD; Mia Jusufbegovic, MD; Ameer Ghodke, MD; Wendell Yarbrough, MD; Trevor Hackman, MD; Catherine Lumley, MD; Travis Schrank, MD, PhD; Jeffrey Blumberg, MD; Samip Patel, MD; University of North Carolina

A128: ENDOSCOPIC SKULL BASE SURGERY FOR FREE FLAP RECONSTRUCTION OF CLIVAL DEFECTS
Ross Rosen, Bsc; Jenna E Bergman, MD; Mark Tabor, MD; Siviero Agazzi, MD, MBA, FACS; Harry Van Loveren, MD; Matthew Mifsud; University of South Florida

A129: ACCURACY AND OUTCOMES OF VIRTUAL SURGICAL PLANNING AND 3D-PRINTED SURGICAL GUIDES FOR OSSEOUS FREE FLAP RECONSTRUCTION OF OSTEORADIONECROSIS-RELATED MANDIBULAR DEFECTS
Elisabeth E Hansen, MSc[1]; Donald J Annino, MD, DMD[2]; Rosh K Sethi, MD, MPH[2]; Sylvia Horne, MD[3]; Eleni M Rettig, MD[2]; Ravindra Uppaluri, MD, PhD[2]; Laura A Goguen, MD[2]; [1]Harvard Medical School; [2]Brigham and Women's Hospital/Dana-Farber Cancer Institute; [3]Northwell Health

A130: OUTCOMES OF TRANEXAMIC ACID IN MICROVASCULAR FREE FLAPS
Rula Mualla, MD; Matthew Bottegal; Nayel Khan, MD; Michael Hu, MD; Shaum Sridharan, MD; Mario Solari, MD; Michael Gimbel, MD; Mark Kubik, MD; University of Pittsburgh

A131: HOW PREOPERATIVE PSYCHOSOCIAL STATUS AFFECTS POSTOPERATIVE OPIATE USAGE IN HEAD AND NECK FREE FLAP PATIENTS
Carlos X Castellanos, MS; Liyang Tang, MD; Niels Kokot, MD; Daniel Kwon, MD; Keck Medicine of USC

A132: BENEFIT OF A SUPRAFASCIAL ANTEROLATERAL THIGH FREE FLAP PERFORATOR HARVEST FOR OPTIMAL REPAIR OF COMPLEX HEAD & NECK DEFECTS.
Ross Rosen, BSc[1]; Travis Hathorn, BSc[1]; Tapan Padhya, MD[2]; Christopher Nickel, MD[2]; Matthew Mifsud, MD[2]; [1]USF Morsani College of Medicine; [2]USF Department of Otolaryngology, Head and Neck Surgery

A133: BENEFITS OF PATIENT-SPECIFIC PLATES IN MANDIBULAR RECONSTRUCTION: A PILOT, EX-VIVO STUDY
Khanh Linh Tran; Matthew Mong; Eitan Prisman; Division of Otolaryngology, Department of Surgery, Faculty of Medicine, University of British Columbia

A134: HETEROTOPIC OSSIFICATION OF FREE FLAP TISSUE GRAFTS IN HEAD AND NECK RECONSTRUCTIVE SURGERY: A SYSTEMATIC REVIEW
Kendyl A Barron, BA; Aman M Patel, BS; Rushi Patel, BS; Sean Z Haimowitz, BS; Vraj P Shah, BS; Richard C. W. Park, MD; Rutgers New Jersey Medical SChool

A135: EVALUATION OF PAROTIDECTOMY DEFECT RECONSTRUCTION: A SYSTEMATIC REVIEW AND META-ANALYSIS
Jacob S Brady, Resident Physician[1]; Julie Y Hwang, Medical Student[2]; G. Nina Lu, Assistant Professor[1]; Peter M Vila, Attending Surgeon[3]; Zain H Rizvi, Assistant Professor[1]; [1]University of Washington; [2]Washington State University; [3]Vila Facial Plastic Surgery

A136: TWO-TEAM VS. SINGLE SURGEON FREE FLAP RECONSTRUCTION OF THE HEAD & NECK: A CASE FOR TEAMWORK & POTENTIAL COST-SAVINGS
Emily C Deane, MD, MSc[1]; Thomas D Milner, MD[1]; Sally Nguyen, FRCSC[1]; Michael Yong, MD, MBA[1]; Alice Q Liu, MD[1]; Kevin Zhao, MD[1]; Jamie Kwon[2]; Xi Yao Gui[2]; Donald W Anderson, FRCSC[1]; J Scott Durham, FRCSC[1]; Eitan Prisman, FRCSC[1]; [1]Division of Otolaryngology, University of British Columbia; [2]University of British Columbia

A137: CONTINUOUS NONINVASIVE NEAR INFRARED SPECTROSCOPY (NIRS) IN FREE TISSUE RECONSTRUCTION OF THE HEAD AND NECK.
Alexandra Kejner, MD; Jonathan Harper, MD; University of Kentucky

A138: ANTICOAGULANTS AND ANTIPLATELET AGENTS FOR THE PERIOPERATIVE MANAGEMENT OF MICROVASCULAR FREE TISSUE RECONSTRUCTION: A SYSTEMATIC REVIEW AND META-ANALYSIS
Travis G Hathorn[1]; Rahul Mhaskar[2]; Sepehr Shabani[3]; Christopher Nickel[3]; Tapan Padhya[3]; Matthew Mifsud[3]; [1]University of South Florida, Morsani College of Medicine, Tampa, Florida.; [2]Department of Internal Medicine, USF Health Morsani College of Medicine, Tampa, Florida.; [3]Department of Otolaryngology-Head and Neck Surgery, USF Health Morsani College of Medicine, Tampa, Florida.

A140: LONGER ISCHEMIC TIMES ARE NOT ASSOCIATED WITH INCREASED COMPLICATIONS IN MICROVASCULAR FREE TISSUE TRANSFER FOR HEAD AND NECK RECONSTRUCTION
Osama A Hamdi, MD[1]; Zenia Chow, MBBS, FRACS[1]; Brian Langford, MD[1]; Michael Dougherty[1]; Madisyn Primas[2]; Amber Yi[2]; David Shonka, MD[1]; Jonathan C Garneau, MD[1]; Mark Jameson[1]; Katherine Fedder[1]; [1]University of Virginia, Department of Otolaryngology - Head and Neck Surgery; [2]University of Virginia School of Medicine

A141: OUTCOMES OF OSSEOUS VS SOFT TISSUE FREE TISSUE TRANSFER FOR SKULL BASE RECONSTRUCTION
Meghan Crippen, MD; Michele Fiorella, MS; Alyssa Givens, BS; Angela Alnemri, BS; Richard Goldman, MD; Joseph Curry, MD; Thomas Jefferson University

A142: MULTIPLE SIMULTANEOUS FREE FLAPS - A MULTI-INSTITUTIONAL CASE SERIES
Theresa Tharakan, MD[1]; Kenneth Akakpo, MD[2]; Gifty Marfowaa[2]; Sidharth Puram[1]; Ryan Jackson[1]; Joseph Zenga, MD[2]; Patrik Pipkorn, MD[1]; [1]Washington University in St Louis; [2]Medical College of Wisconsin

A144: STACKED FIBULA FLAP FOR TOTAL MAXILLECTOMY RECONSTRUCTION WITH ORBITAL PRESERVATION
Jennifer Gross[1]; Tyler G Chan[1]; Patrik Pipkorn, MD[2]; Chris Nickel, MD[1]; Rachel Irizarry[1]; Clementino A Solares, MD[1]; H M Baddour, MD[1]; [1]Emory University; [2]Washington University in Saint Louis

A145: TECHNIQUE, OUTCOMES, PEARLS, AND PITFALLS OF AN UNCOMMONLY USED INFRAHYOID FLAP IN THE RECONSTRUCTION OF ORAL CAVITY CANCER DEFECTS.
Sashikanth Jonnalagadda, MD; Amjad Khan Mohammed, MD; Citizens hospital

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A147: LONG-TERM OUTCOMES OF CRANIOPLASTY RECONSTRUCTIONS REQUIRING FREE FLAP COVERAGE
Allison A Slijepcevic, MD[1]; Brian L Scott, MD[1]; Grabriela L Lilly, MD[1]; Mark K Wax, MD[1]; Patrik Pipkorn, MD[2]; Jason Rich, MD[2]; Ryan Jackson, MD[2]; Ryan Li, MD[1]; Daniel Petrisor, DMD, MD[1]; Sidharth V Puram, MD, PhD[2]; [1]Oregon Health and Science University; [2]Washington University in St. Louis

A148: IMPACT OF FRAILTY ON POSTOPERATIVE COMPLICATIONS AND SURVIVAL AFTER FREE FLAP RECONSTRUCTION
Hemali P Shah, BS; Alexandra T Bourdillon, BS; Jordan Sukys, MD; Oded Cohen, MD; Saral Mehra, MD, MBA, FACS; Department of Surgery, Division of Otolaryngology Yale School of Medicine

A149: MICROVASCULAR RECONSTRUCTION IN THE TIMES OF COVID-19: LENGTH OF STAY AND READMISSIONS
Ari D Schuman, MD, MSCR[1]; Mohini Bindal, MS[1]; Anne M Turney, BA[1]; David J Hernandez, MD[1]; Angela D Haskins, MD[1]; Vlad C Sandulache, MD, PhD[1,2]; Erich M Sturgis, MD, MPH[1]; Andrew T Huang, MD[1,2]; [1]Bobby R. Alford Department of Otolaryngology-Head and Neck Surgery, Baylor College of Medicine; [2]ENT Section, Operative Care Line, Michael E. DeBakey Veterans Affairs Medical Center

A150: OUTPATIENT PAROTIDECTOMY: SAFETY OUTCOMES, PATIENT CONVENIENCE, AND PATIENT SATISFACTION IN PARTIAL, SUPERFICIAL, AND DEEP LOBE PAROTIDECTOMY
Emily E Karp, MD; Linda X Yin, MD; Katherine P Wallerius, MD; Kendall K Tasche, MD; Kathryn M Van Abel, MD; Jan L Kasperbauer, MD; Eric J Moore, MD; Daniel L Price, MD; Mayo Clinic

A151: DEFINING THE CLINICAL CHARACTERISTICS OF MAMMARY ANALOGUE SECRETORY CARCINOMA OF THE SALIVARY GLAND: ANALYSIS OF THE NATIONAL CANCER DATABASE
Akshilkumar Patel, BS[1]; Brandon LaBarge, MD[2]; Tonya S King, PhD, MS[3]; Sandeep Pradhan, MBBS, MPH[3]; Neerav Goyal, MD, MPH, FACS[2]; [1]The Pennsylvania State University College of Medicine, Hershey, PA, USA; [2]Department of Otolaryngology - Head and Neck Surgery, Penn State Health Milton S. Hershey Medical Center, Hershey, PA, USA; [3]Department of Public Health Sciences, The Pennsylvania State University College of Medicine, Hershey, PA, USA

A152: PATTERNS OF RECURRENCE AND METASTASIS IN ADENOID CYSTIC CARCINOMA OF THE SKULL BASE
Peter Lancione, MD; Sarah Nyirjesy, MD; Matthew Old, MD; The Ohio State University Wexner Medical Center

A153: POPULATION BASED SURVIVAL ANALYSIS OF SQUAMOUS CELL CARCINOMA OF THE PAROTID GLAND: A SEER DATABASE REVIEW
Nizar Tejani, MD; Runhua Shi, MD, PhD; Ameya Asarkar, MD; LSU Health Shreveport

A154: DEFINING NOVEL SUBPOPULATIONS IN HUMAN SALIVARY GLANDS USING SINGLE CELL RNA-SEQUENCING AND INVOLVEMENT IN CANCER PROGRESSION
Takuya Nakagawa, MD, PhD[1]; Jessica Santos[1]; Chanond Nasamran[2]; Sayed Sadat[1]; Koji Ebisumoto[1]; Jinjin Hu[3]; Sebastian Preissl[4]; Theresa Gujo[5]; Vera Vavinskaya[3]; Kathleen M Fisch[2]; Joseph A Califano, MD[5]; [1]Moores Cancer Center, University of California San Diego; [2]Department of Medicine, Center for Computational Biology and Bioinformatics, University of California San Diego; [3]Department of Pathology, University of California San Diego; [4]Center for Epigenomics, Department of Cellular and Molecular Medicine, University of California San Diego; [5]Division of Otolaryngology - Head and Neck Surgery, Department of Surgery, University of California San Diego

A155: PATTERNS OF CARE AND OUTCOME OF CARCINOSARCOMA OF THE SALIVARY GLANDS
Abhinav Talwar, BA[1]; Evan Patel, MD[2]; Fang Zhou, MD[3]; Adam Jacobson[4]; Moses Tam, MD[5]; Babak Givi, MD[4]; [1]Northwestern University, Feinberg School of Medicine; [2]Department of Otolaryngology, University of California at San Francisco; [3]Department of Pathology and New York University Langone Health; [4]Department of Otolaryngology, NYU Langone Health; [5]Department of Radiation Oncology, NYU Langone Health

A156: HOSPITAL FRAILTY RISK SCORE IS AN INDEPENDENT PREDICTOR OF OUTCOMES IN CUTANEOUS SQUAMOUS CELL CARCINOMAS OF HEAD AND NECK REGION.
Rema A Kandula, MD; Sandeep Kandregula, MD; Bharat Guthikonda, MD; John Pang, MD; Ameya Asarkar, MD; Cherie-Ann O Nathan, MD; LSU Health sciences Shreveport

A157: THE ARGUMENT FOR ADJUVANT THERAPY FOR STAGE II HEAD AND NECK MELANOMA- COULD A NOMOGRAM ASSIST DECISION MAKING?
Helena Levyn, MD; Schlomo Schneebaum, MD; Tel Aviv Sourasky Medical Center

A158: CUTANEOUS SQUAMOUS CELL CARCINOMA IN IMMUNOCOMPROMISED PATIENTS- A COMPARISON BETWEEN DIFFERENT IMMUNOMODULATING CONDITIONS
Ofir Zavdy, MD, MPH; Tara Coreanu, MD; Dvir Bar On, MD; Amit Ritter, MD; Gideon Bachar, MD; Thomas Shpitzer, MD; Noga Kurman, MD; Muhammad Mansour, MD; Dean Ad-El, MD; Uri Rozovski, MD; Gilad Itzhaki, MD; Shani Sherman-Bergman, MD; Limor Azulay-Gitter, MD; Aviram Mizrachi, MD; Rabin Medical Center

A159: A VACCINE FOR SKIN CANCER?: PREVIOUS HPV-POSITIVE CANCER AND HPV VACCINATION ASSOCIATION WITH CUTANEOUS SQUAMOUS CELL CARCINOMA
Susan Kurian, MD; Gauri Shishodia, PhD; Ashley Flowers, MD; Brent Chang, MD, FACS; Cherie-Ann O Nathan, MD, FACS; Ochsner LSU Health Shreveport

7:30 pm – 8:30 pm **Reunion AB**

President's Reception

ORAL PAPERS

AHNS01: RISK LEVEL STRATIFICATION USING CIRCULATING TUMOR DNA IN HEAD AND NECK CANCER PATIENTS

Liyona Kampel, MD, PhD; Sara Davidova, MD; Shlomo Zuriel, PhD; Narin Carmel Neiderman, MD; Dov Hershkovitz, MD, PhD; Nidal Muhanna, MD, PhD; Tel Aviv Sourasky Medical Center

Importance: Next generation sequencing (NGS) allows the detection of low abundance tumor specific genetic alterations in circulating cell-free DNA. Detectable circulating tumor DNA (ctDNA) in patients with head and neck squamous cell carcinoma (HNSCC), at the time of diagnosis, may indicate high-risk disease and prompt treatment escalation.

Objective: ctDNA, containing tumor-specific mutational signature, has been suggested as a surrogate biomarker for early detection of cancer recurrence and for monitoring treatment response. We aimed to explore whether detecting ctDNA in newly diagnosed head and neck squamous cell carcinoma (HNSCC) patients can provide molecular risk stratification.

Study design: A cohort of newly diagnosed HNSCC patients, treated with upfront surgical resection at a referal tertiary medical center between 2014 and 2021. Utilizing ultrasensitive NGS, TP53 coding regions were sequenced in HNSCC specimens. The utility of targeted sequencing of TP53 gene for the detection of tumor specific somatic alterations in circulating cell free DNA was assessed. Adverse pathological features and clinical outcomes were analyzed in relation to ctDNA detection.

Results: Overall, TP53 was sequenced in 45 tumor specimens. Somatic mutations in TP53 were identified in 82% of patients. Following TP53 profiling, circulating DNA were scrutinized for the presence of tumor specific mutations: cell free DNA was extracted from plasma samples (N=20), subjected to polymerase chain reaction (PCR) amplification of the amplicon containing the tumor-specific alternation and deeply sequenced. ctDNA, with the mutated TP53, was detected in 14 patients (70%), with allele frequency of 0.2%-2%. Advanced stage disease, perineural invasion and deep invasion were more frequently found in patients whose ctDNA was detected. Detectable ctDNA corresponded with regional spread (N stage ≥ 1, P = 0.04) and a tendency to worse disease-free survival (P = 0.066).

Conclusions and relevance: Targeted sequencing of TP53 gene in HNSCC using NGS technology can be utilized for the detection of low abundance tumor specific genetic alteration in circulating DNA. ctDNA detection correlated with pathological adverse features, indicating the potential implementation of ctDNA-based molecular profiling for identifying patients who may benefit from intensified treatment regimens.

AHNS02: EVEROLIMUS INHIBITS P53 MUTANT HNSCC BY MODULATING ANGIOGENESIS AND LYMPHANGIOGENESIS MECHANISMS LINKED TO MTOR/HIF1A/VEGF SIGNALING

Janmaris Marin Fermin; Md Maksudul Alam, PhD; Kyle A Boudreaux, MS, IV; Landon D Goodreau; Taylor L Powell; Tara Moore-Medlin; Xiaohua Rong; Jerry McLarty; Xin Gu; Cherie-Ann O Nathan; LSU-Health Shreveport

Background: Head and Neck Squamous Cell Carcinomas (HNSCC) constitute the eighth most common cancer globally, with the eighth highest mortality rate amongst all cancer types. TP53 is the most frequently mutated gene in HNSCC. TP53 mutant HNSCC displays a genetic aberration in the mammalian target of Rapamycin (mTOR) pathway, which is involved in various oncologic processes such as cell growth, proliferation, and angiogenesis. Compared to wild-type TP53, mutant TP53 HNSCC exhibits poor survival and prognosis, warranting an urgent need for effective therapy. Everolimus is an mTOR inhibitor that has been traditionally used as an immunosuppressant in solid organ transplantation. Recently, Everolimus has been investigated as a potential anticancer agent due to its ability to indirectly inhibit tumor angiogenesis and decrease vascularity, along with directly inhibiting tumor cell growth and proliferation. Additionally, a phase two clinical trial showed that HNSCC patients had a significantly improved 2-year progression-free survival when treated with Everolimus. This study aims to evaluate whether the antitumor activity of Everolimus is related to the modulation of angiogenesis and lymphangiogenesis in TP53 mutant HNSCC xenografts.

Methods: p53 mutant HNSCC cell lines were grown in regular culture conditions and treated with Everolimus (100 ng/ml) for 24 hours. Enzyme-Linked Immunosorbent Assay (ELISA) was used to measure VEGF in the cell culture supernatant quantitatively. TP53 mutant HNSCC cells (HN31 and FaDu) were injected into the flank of athymic nude mice. After five days, mice were treated with an oral suspension of Everolimus (5mg/kg in 1% CMC-Na) for three weeks, while control mice received 1% CMC-Na. Tumor volume and body weight were monitored three times a week. At the end of the experiment, tumors were harvested and analyzed by immunohistochemistry to examine tumor vascularization. Tumor lysates were analyzed by Western blot to determine protein levels of the mTOR, pS6/HIF-1α/VEGF-A signaling.

Results: Treatment with a daily 5mg/kg dose of Everolimus displayed a significant suppression of tumor growth and mTOR signaling as indicated by suppressed S6 phosphorylation. ELISA, Western blot analysis demonstrated that Everolimus downregulated levels of HIF1A and VEGF-A protein expression. Additionally, the immunohistochemical analysis showed that the antitumor activity of Everolimus was associated with anti-angiogenesis and anti-lymphangiogenesis, as indicated by a significantly decreased microvessel density of vascular and lymphatic vessels in HN31 and FaDu xenografts ($p<0.05$).

Conclusions: Our data suggest that Everolimus prevents TP53 mutant xenograft growth by inhibiting angiogenesis and lymphangiogenesis through downregulation of mTOR/HIF-1α/VEGF-A signaling. Our study suggests a promising role for mTOR inhibitors in the prevention of p53 mutant HNSCC recurrence.

AHNS03: RADIATION IMPROVES THE THERAPEUTIC ANTIBODY DELIVERY IN HEAD AND NECK CANCERS.

Laura Freeman, MD; Guolan Lu, PhD; Eben Rosenthal; Stanford

Introduction/Background: Heterogenous drug delivery in tumor leads to poor drug response, thus improving drug delivery can improve drug response. Previous studies have shown that modulating the tumor microenvironment can improve drug delivery and response. We hypothesize that radiation can increase drug delivery by modulating the tumor microenvironment. We propose to use a fluorescently labeled therapeutic antibody as an imaging tool to investigate drug delivery into head and neck cancer in a xenograft mouse tumor model.

Experimental design: We conducted an experiment examining drug delivery of Cetuximab-IRDye 800 (CTX-800) in a subcutaneous mouse model. Thirty mice were injected with SCC-47 in the flank. After the tumors had reached appropriate size, fifteen experimental mice were injected with .2 mg of CTX-800

and the radiated with 5gy. The fifteen control mice were injected with .2 mg of CTX-800, but did not receive radiation therapy. Three time points were examined 24, 48, and 72 hrs. At each time point tumors from five of the control mice and five of the experimental mice were imaged in vivo using the Pearl Imaging system. Immediately following imaging the mice from both the experimental and control group were sacrificed at each time point. The tumors and other organs were dissected and imaged using the Pearl imaging system to evaluate for fluorescence.

Results and Conclusion: Mean Fluoresce Intensity (MFI) was higher in the radiated mice compared to the non-radiated mice both in vivo and ex vivo. This suggests that radiation can increase drug delivery to tumors and has implications for timing of radiation and chemotherapy delivery.

AHNS04: CHARACTERIZING THE TUMOR MICROENVIRONMENT OF IMMUNOSUPPRESSED CUTANEOUS SQUAMOUS CELL CARCINOMA

Mica Glaun, MD[1]; Frederico Gleber-Netto, PhD[1]; Priyadharsini Nagarajan, MD[1]; Tongxin Xie[1]; Jennifer Covello[1]; Shamima Akhter[1]; Adebayo Adewale[1]; Erez Baruch[1]; Michael Wong[1]; Kenneth Tsai[2]; Elsa Flores[2]; Michael Migden[1]; Deborah Silverman[1]; Ryan Goepfert[1]; Yejing Ge[1]; Padamanee Sharma[1]; James Allison[1]; Jeffrey Myers[1]; Neil Gross[1]; Moran Amit[1]; [1]MD Anderson Cancer Center; [2]Moffitt Cancer Center

Background: Systemic immunotherapy is a promising therapy for cutaneous squamous cell carcinoma of the head and neck (cSCCHN) patients. However, many cSCCHN patients are affected by chronic immunosuppression (IS), which contraindicates the use of this highly effective therapy due to the inherent risks of systemic immunomodulation in this vulnerable population. Innovative immunotherapy approaches, such as local drug administration, could potentially offer lower risks for these IS patients. However, it is currently unknown whether the tumor microenvironment (TME) of IS cSCCHN individuals differs from immunocompetent (IC) ones and whether they would benefit from such therapy. Here we aimed to specify how the TME of IS cSCCHN patients differs from IC ones and what is the dynamics of TME through the tumorigenesis stages of cSCCHN IS patients.

Methods: To investigated the TME of IS and IC cSCCHN patients we build tissue microarrays (TMA) with primary tumor, keratinocytic intraepithelial neoplasia (KIN) and normal tissue of cSCCHN patients treated and MD Anderson and MOFFITT Cancer Centers. The TMAs were subjected to immunofluorescence staining using the Opal 7-color Multiplex Staining Kit and primary antibodies against cytokeratin, CD68, CD8, CD4, CD20, PD-L1, Lag3 and FoxP3. The stained slides were scanned in a Vectra Polaris Multispectral scanner, and the images were annotated with the Phenochart software and analyzed with the Akoya inForm software. Cell counts obtained for each cell phenotype were normalized by the tissue area according to their distribution along the tumor parenchyma and stroma.

Results: This study revealed a statistically significant lower density of CD68+ cells within the tumor (CK+) and stroma (CK-) of the IS patients when compared to the IC patients. In addition, CD68+PDL+ was found to have a higher density within the IS tumor when compared to the stroma. A statistically significant increase in CD68+PD-L1 was seen in the IS population with progression from KIN to invasive SCC. This study identified a strong correlation between stromal and tumoral immune cells within IS cohort which was not seen within the IC cohort. Stroma was not found to mirror tumoral compartments. Overall, analyzing the etiology of immunosuppression revealed lower amounts of CD8+/LAG3+ T-cells in lymphoma and leukemia patients. Within the organ transplantation population included within this study, a broad reduction of effector T cells was identified. Patients with IS had poorer clinical outcomes when compared to their matched controls. The number of CD68+ and CD8+LAG3+ in the tumor microenvironment were found to be predictors of disease specific survival and disease free survival.

Conclusions: This study surprisingly found that the most significant difference in the development of squamous cell carcinoma between immunosuppressed and immunocompetent hosts is a reduced innate immune response.

AHNS05: NEUTROPHIL TO LYMPHOCYTE RATIO AND PERIPHERAL BLOOD BIOMARKERS CORRELATE WITH OUTCOMES AMONG PATIENTS WITH RECURRENT METASTATIC HEAD AND NECK SQUAMOUS CELL CARCINOMA AND SALIVARY GLAND CANCER TREATED ON A PHASE II TRIAL OF PEMBROLIZUMAB AND VORINOSTAT

Cassie Pan[1]; Qian (Vicky) Wu[2]; Jenna Voutsinas[2]; Jeffrey J Houlton[1]; Brittany Barber[1]; Neal Futran[1]; Renato G Martins[3]; Jonathan R Fromm[4]; Cristina P Rodriguez[3]; [1]Department of Otolaryngology, University of Washington, Seattle, WA; [2]Public Health Sciences Division, Fred Hutchinson Cancer Research Center, Seattle, WA; [3]Division of Oncology, Department of Medicine, University of Washington, Seattle, WA; [4]Department of Laboratory Medicine, University of Washington, Seattle, WA

Introduction: Peripheral blood markers predictive of outcomes and toxicity to immune checkpoint inhibitors are unexplored in head and neck malignancies. Our group has published a phase II clinical trial (Clin Cancer Res 2019, NCT02538510) of pembrolizumab and vorinostat (P+V) among recurrent/metastatic head and neck squamous cell carcinoma (HN) and salivary gland cancer (SGC) and obtained peripheral blood correlatives. We sought to explore associations between peripheral blood biomarkers and oncologic outcomes as well as toxicity.

Methods: Patients with progressing incurable HN and SGC were enrolled and received P 200 mg intravenous every 21 days and V 400 mg orally 5 days on/2 days off during each 21-day cycle. Correlative blood samples were collected at baseline and after three cycles of P+V when possible. LSRII flow cytometry (BD Biosciences) was performed on these samples using Woodlist 3.1 software to characterize baseline and on-treatment peripheral T cell phenotypes, including CD3+/CD4+ (helper) and CD3+/CD8+ (cytotoxic) T cells, as well as PD1 and PDL1 expression on CD4+ and CD8+ T cells. Additionally, baseline and on-treatment neutrophils, lymphocytes, platelets and neutrophil-to-lymphocyte ratio (NLR) were obtained. Combined positive score (CPS) was not routinely obtained during this time period. Univariable Cox regression was performed to explore associations between a covariate of interest (e.g., T cell phenotypes) and time-to-event outcomes, such as overall survival (OS) and progression free survival (PFS). Logistic regression was performed with binary outcomes, such as objective response (ORR) based on RECIST 1.1 criteria and grade ≥3 toxicities (G≥3AE) based on CTCAEv5.

Results: This trial enrolled 25 HN and 25 SGCs between 11/2015 and 8/2017. Outcome results were previously published. Baseline peripheral blood was available in 21 HN and 20 SGCs. Lower baseline NLR correlated with improved OS (HR 1.12, [95% CI 1.04-1.20], p=0.001), PFS (HR 1.11, [1.04-1.19], p=0.001), and

lower rates of G≥3AE (OR 1.09, [1.00-1.19], p=0.04). Additionally, superior OS and PFS were associated with lower baseline absolute neutrophils (OS: HR 1.43, [1.17-1.75], p=0.0005) (PFS: HR 1.28, [1.09-1.51], p=0.003) and relative neutrophils (OS: HR 1.08, [1.02-1.13], p=0.004) (PFS: HR 1.07, [1.02-1.12], p=0.005), higher baseline relative lymphocytes (OS: HR 0.93, [0.88-0.99], p=0.021) (PFS: HR 0.93, [0.87-0.98], p=0.007), and higher baseline T helper cells (OS: HR 0.84, [0.75-0.95], p=0.005) (PFS: HR 0.84, [0.75-0.94], p=0.002). No relationship between ORR and any peripheral biomarker was observed.

Conclusions: In a small prospectively evaluated cohort of HN and SGCs treated with a combination of pembrolizumab and vorinostat, lower pretreatment NLR and neutrophils as well as higher pretreatment lymphocytes and T helper cells were associated with improved OS and PFS. Lower baseline NLR was further predictive of lower rates of serious adverse events. These peripheral blood biomarkers merit validation in a larger study and correlation with the validated CPS biomarker, as well as with more standard pembrolizumab monotherapy.

AHNS06: MASS SPECTROMETRY IMAGING OF THE METABOLIC LANDSCAPE OF HUMAN PAPILLOMAVIRUS-ASSOCIATED VERSUS CARCINOGEN-DRIVEN HEAD AND NECK SQUAMOUS CELL CARCINOMA

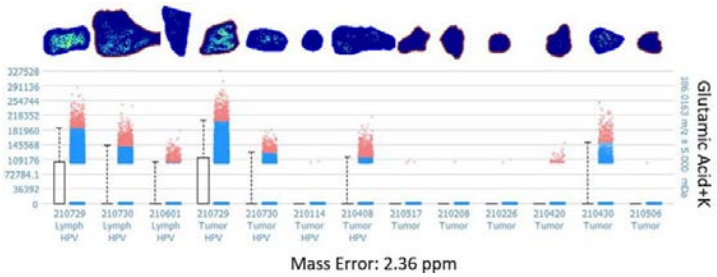
Richard A Harbison, MD[1]; William Andrews[2]; Rajeev Pandey[1]; Rebecca Dempsey[1]; Rajarsi Mandal[1]; Robert Casero[1]; Drew Pardoll[1]; Carole Fakhry[1]; Maureen Kane[2]; Jonathan Powell[1]; Erika Pearce[1]; [1]Johns Hopkins Hospital; [2]University of Maryland

Background: Specialized metabolism of tumor cells results in the creation of an acidic, hypoxic, nutrient-depleted microenvironment coupled with a metabolic milieu that is hostile to the anti-tumor immune response. The metabolic milieu of human papillomavirus (HPV)-associated versus carcinogen-driven head and neck squamous cell carcinomas (HNSCs) is unknown. Here we present a novel analysis using mass spectrometry imaging to interrogate the metabolic landscape of head and neck cancer with the long-term goal of identifying targetable metabolic pathways to enhance anti-tumor immune responses and overcome hurdles of resistance to immunotherapy.

Methods: HNSC specimens were slow frozen over liquid nitrogen after tumor extirpation, and tumor sections were cut onto glass slides. Slides were coated in alpha-cyano-4-hydroxy-cinnamic acid (CHCA) matrix and subjected to mass spectrometry imaging using matrix-assisted laser desorption ionization (MALDI) on a Bruker SolariX XR 12T Hybrid QqFT-ICR mass spectrometer.

Results: A total of seven HPV-associated (three metastatic lymph nodes and four primary tumors) and six carcinogen-driven (primary tumors) HNSC specimens were analyzed. Metabolites significantly enriched in HPV-associated HNSC relative to carcinogen-driven HNSC were glutamine, inosine monophosphate, spermidine, spermine, xanthine, and indole-3-carboxyaldehyde. Metabolites significantly enriched in carcinogen-driven HNSC relative to HPV-associated HNSC were s-adenosylmethionine, hypoxanthine, and phosphorylcholine. Metabolites enriched among HPV-associated primary tumors relative to all other samples include O-propanoyl-D-carnitine, kynurenic acid, and valerylcarnitine. Adenosine monophosphate was enriched in HPV-associated metastatic lymph nodes compared to all other samples.

Conclusion: This is the first study to perform high resolution imaging of the metabolic milieu of head and neck cancer. Several candidate metabolites were differentially enriched in HPV-associated primary tumors or lymph nodes compared to carcinogen-driven primary HNSCs. In ongoing analyses, we are staining these MALDI slides for CD8+ T cell and macrophage markers to correlate metabolite enrichment with immune cell infiltration to evaluate for evidence of immune cell exclusion or enrichment in a metabolite-dependent context. These data aim to overcome the hurdle of resistance to immunotherapy and anti-tumor immune response.



AHNS07: 5-AMINOLEVULINIC ACID FLUORESCENCE-GUIDED SURGERY IN HEAD AND NECK SQUAMOUS CELL CARCINOMA: A PILOT TRIAL

Peter Filip; David Lerner; Katherine Liu; Evan Kominsky; Brandon Gold; Annie Arrighi-Allisan; David Campbell; Mohemmed N Khan; Scott Roof; Constantinos Hadjipanayis; Eric Genden; Alfred Marc Iloreta; Icahn School of Medicine at Mount Sinai

Background: 5-aminolevulinic acid (5-ALA), Gleolan ®, is a photosensitizing agent used in fluorescence guided surgery (FGS) to facilitate visualization of tumors intraoperatively. 5-ALA is currently FDA approved for fluorescence-guided resection of WHO grade III and IV malignant gliomas, where it has been shown to improve margin status and survival rates. 5-ALA has previously been shown to induce fluorescence when topically applied to squamous cell carcinomas of the oral cavity, pharynx, and larynx, but to the authors' knowledge, its use intraoperatively in the resection of aerodigestive head and neck squamous cell carcinoma (SCCa) via oral preoperative administration has never been studied. We present the first experience of an ongoing pilot trial to evaluate the feasibility and efficacy of oral 5-ALA administration to facilitate intraoperative head and neck SCCa resection.

Methods: This ongoing prospective pilot trial includes patients with biopsy proven aerodigestive head and neck SCCa from September 2021 onward with a projected end date of May 2022. Demographics, primary tumor pathology, intraoperative techniques, and adverse reactions will be collected. 5-ALA is administered in the form of an oral solution 3-5 hours before induction of anesthesia. Intraoperatively, 405 nm blue light is applied via headlight and operating microscope to visualize tumor fluorescence. Specimen fluorescence intensity is graded on a scale from 0-3 (0= no fluorescence, 3= intense fluorescence).

Results: 3 patients have been recruited. All 3 are male with an age range of 51-65 years (average: 58.3 years). The final pathology for all patient specimens was moderately differentiated squamous cell carcinoma. Use of 5-ALA yielded excellent fluorescence of squamous cell carcinoma in the nasal cavity, oral cavity, and larynx with all specimens demonstrating grade 3 fluorescence. The laryngectomy specimen demonstrated satellites of mucosal

fluorescence which were notable for dysplasia. The absence of tumor in the deep margin, thus far, correlates with negative frozen section analysis and negative margin status on permanent pathological analysis of all patients. 2 patients had mild photosensitivity reactions and 1 patient had a mild liver function test elevation which normalized on postoperative day 2.

Conclusions: 5-ALA can successfully and safely induce intraoperative fluorescence of aerodigestive SCCa and possibly dysplastic mucosa. The utility of this agent may lie in early detection and localization of squamous cell carcinoma, as well as intraoperative assessment of margins and residual tumor in sensitive areas along the skull base, orbit, and neurovascular structures; however, this must be elucidated with further studies. Likely limitations will include detection of fluorescence with the human eye (as opposed to spectrophotometric devices) and background fluorescence of normal mucosa. Future uses in endoscopic skull base surgery, ablative head and neck surgery, parathyroidectomy, robotic surgery, neck dissections, as well as intraoperative margin status assessment and survival will be studied in forthcoming trials.

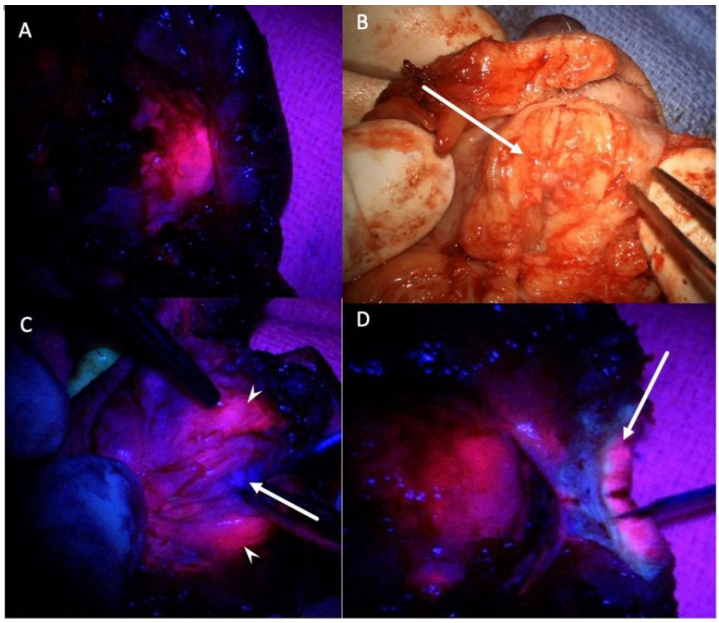


Figure 1. (A) Rhinectomy specimen under 405nm light excitation demonstrating grade 3 fluorescence. (B) Rhinectomy specimen with bisected tumor under white light (arrow). (C) Bisected tumor with central necrosis (arrow) demonstrating decreased fluorescence strength as compared to the tumor periphery (arrowheads). (D) Cross section demonstrating tumor fluorescence and fluorescence of the normal dermis (arrow).

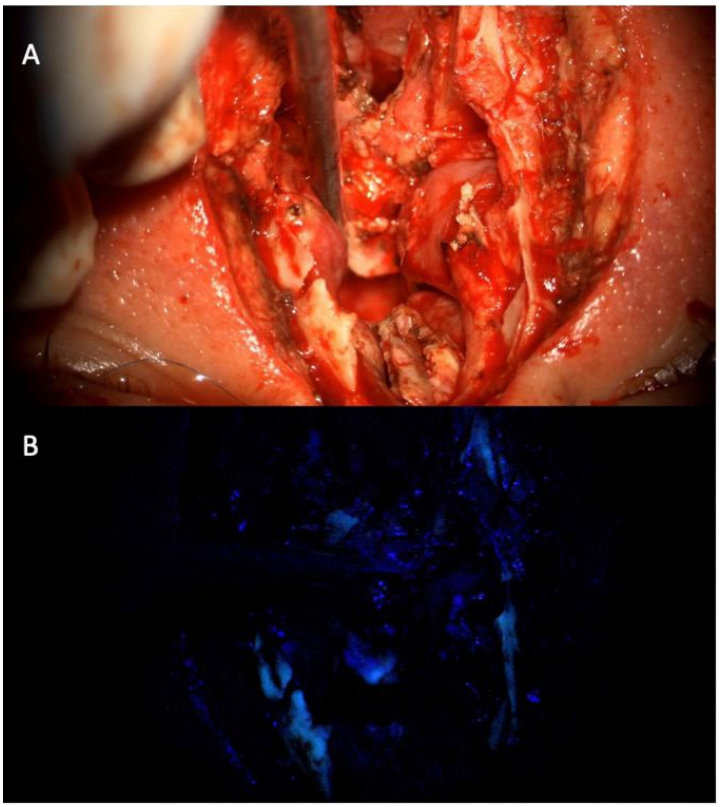


Figure 2. (A) Rhinectomy resection cavity under white light illumination, and (B) 405nm blue light excitation demonstrating no fluorescence.

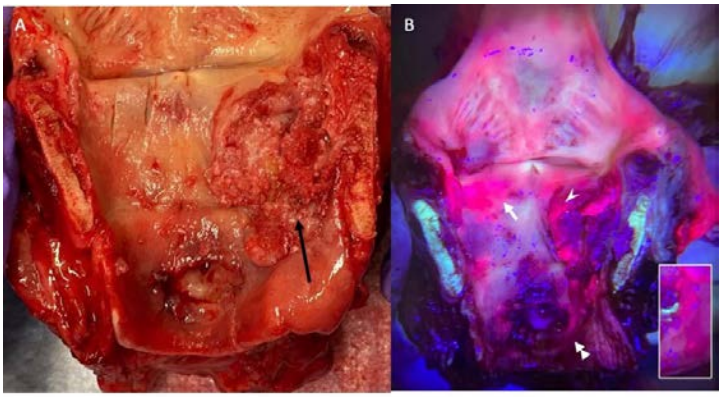


Figure 3. (A) Total laryngectomy specimen under white light with biopsy proven squamous cell carcinoma (arrow). (B) Total laryngectomy specimen under blue light. The tumor periphery demonstrates grade 3 fluorescence (arrowhead) with a necrotic center with grade 0 fluorescence. Also seen is fluorescence of the left true vocal cord (arrow) which revealed dysplasia, and fluorescence of normal inflammatory tissue surrounding a previous tracheostomy site (double arrowhead, inset).

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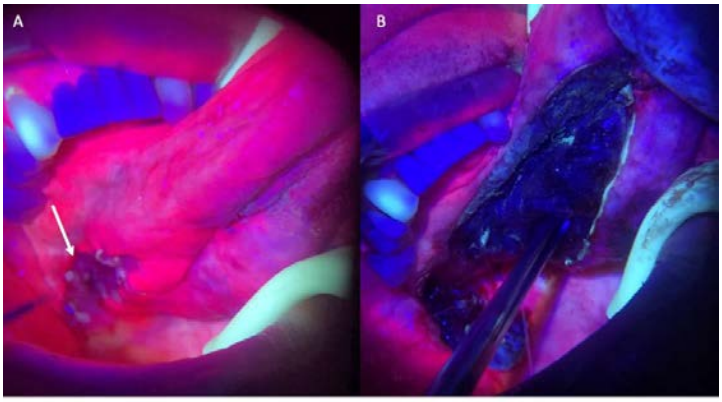

Figure 4. (A) Squamous cell carcinoma of the left lateral tongue (arrow) demonstrates necrosis with decreased fluorescence. The oral mucosa demonstrates global, robust fluorescence, which is brightest at the tumor margin, but also present in normal tissue. (B) Hemiglossectomy defect with tumor bed showing an absence of fluorescence under blue light.

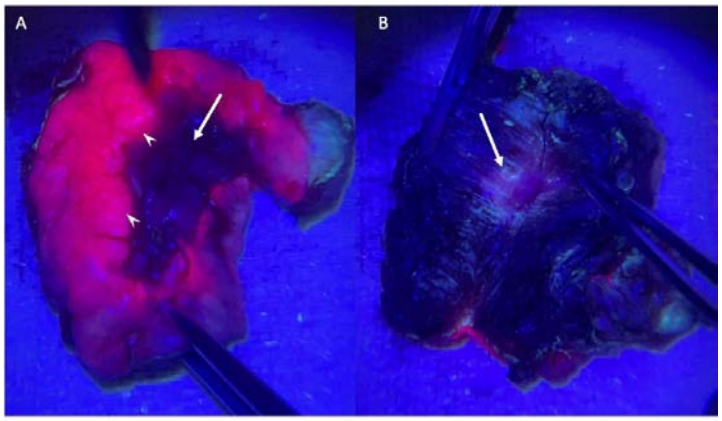

Figure 5. (A) Hemiglossectomy specimen demonstrating central necrosis with no fluorescence (arrow) surrounded by grade 3 fluorescent tumor (arrowheads). (B) Deep margins of bisected specimen demonstrating an absence of fluorescence. Very mild fluorescence (grade 1) is seen as the bisection nears tumor tissue (arrow).

Table 1. Patient characteristics

Patient	Age	Sex	Primary Tumor Site	Preoperative Chemoradiotherapy	Procedure	Intraoperative Fluorescence Grade (0 = low, 3 = high)	Adverse Events	Final Pathology
1	51	M	nasal cavity	chemotherapy	Total rhinectomy, partial maxillectomy, bilateral SND, left scapula flap reconstruction	3	photosensitivity reaction	moderately differentiated SCCa
2	65	M	subglottis	none	Total laryngectomy, bilateral SND, right anterolateral thigh flap reconstruction	3	none	moderately differentiated SCCa
3	59	M	oral cavity	none	Left hemiglossectomy, left SND, left radial forearm flap reconstruction	3	photosensitivity reaction, preoperative nausea	moderately differentiated SCCa

Abbreviations: SND, selective neck dissection; SCCa, squamous cell carcinoma

AHNS08: PERIOPERATIVE TOPICAL ANTISEPSIS AND SURGICAL SITE INFECTION IN UPPER AERODIGESTIVE FREE FLAP RECONSTRUCTION

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IMPORTANCE: Development of surgical site infections (SSI) after vascularized reconstruction of the upper aerodigestive tract (UADT) can lead to significant morbidity including prolonged hospital length of stay, impaired wound healing, as well as, worsened aesthetic and functional outcomes. The variability of perioperative prophylaxis practices between institutions, particularly pre- and intraoperative topical antisepsis, and their association with SSI incidence is unknown.

OBJECTIVE: To assess the association between perioperative topical antisepsis and SSIs in patients undergoing vascularized reconstruction of the UADT

DESIGN: Prospective observational cohort

SETTING: Multi-institutional

INCLUSION CRITERIA: Patients undergoing open surgical procedures requiring a communication between the upper aerodigestive tract and cervical skin with either a regional pedicled and/or free flap. Patients had to demonstrate no evidence of active infection at the time of surgical procedure.

MAIN MEASURES AND OUTCOMES: The primary outcome measure was SSI within 30 days of head and neck surgery. The association of demographics, perioperative antibiotic prophylaxis, surgical details, and post-operative care factors with SSIs was assessed using univariable and multivariable logistic regression models.

RESULTS: 554 patients who fulfilled inclusion criteria from 7/1/2020 to 6/1/2021 were included from twelve academic medical centers. The number of patients included per center ranged from 13 to 91. The median age was 64 years (range 21-95 years). Overall SSI rate was 20% (n=116), varying between centers from 6.0% to 42.9%. Most infections involved the head and neck surgical site only (n=91, 78.4%). The mean time to SSI diagnosis was 11 days (range 1-28 days). Topical mucosal antisepsis was performed in 35% (n=195) of cases preoperatively. Most frequently with povidone-iodine alone (n= 99, 17.9%), followed by chlorhexidine alone (n=47, 8.5%) and both povidone-iodine and chlorhexidine (n=47, 8.5%). Postoperatively, 52% (n=289) of cases performed topical mucosal antisepsis. Intraoperative antiseptic irrigations were performed in 11% (n=61) of cases. Systemic antibiotic prophylaxis choices and duration varied, the most common choice was ampicillin/sulbactam (n=367, 66.2%) followed by piperacillin/tazobactam (n=83, 15.0%) with the most common duration being 24 hours (n=363, 65.5%) followed by 48 hours (n=97, 17.5%). The oral cavity was the most frequently involved head and neck subsite (n=394, 71.1%) followed by the larynx (n=71, 12.8%). While indications for the surgical procedures varied, cancer ablation was the most frequent (n=480, 86.6%). On multivariable analysis preoperative topical mucosal prep was associated with a decreased risk of postoperative SSI (OR 0.55; 95% CI 0.34- 0.88). Other factors associated with a decreased risk of postoperative SSI on multivariable analysis included antibiotic prophylaxis with piperacillin/tazobactam (OR 0.42; 95% CI 0.20-0.85), use of a soft tissue only vascularized flap (OR 0.45; 95% CI 0.29- 0.74), and use of greater than 24 hours of prophylactic antibiotics (OR 0.57; 95% CI 0.35-0.95).

CONCLUSION: While perioperative practices varied between

academic centers performing vascularized flap reconstruction of UADT defects, pre-operative topical mucosal preparation was significantly associated with decreased SSI in a 12-center multi-institutional prospective cohort. Further investigation of the impact of individual perioperative practices on the incidence of post-operative SSIs is necessary to develop evidence-based protocols to reduce SSIs after UADT reconstruction.

AHNS09: EFFECT OF PREOPERATIVE IMMUNOTHERAPY ON COMPLICATIONS AFTER HEAD AND NECK SURGERY

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Introduction: Although infrequent, immunotherapy can lead to systemic inflammation and subsequent adverse outcomes in patients with head and neck cancer. There is sparce literature on the effect of preoperative immunotherapy on complications in patients undergoing head and neck cancer surgery.

Objectives: We aim to compare surgical, medical, and overall complication rates in patients receiving neoadjuvant immunotherapy versus upfront surgery. We aim to evaluate factors predicting increased complication rate in our cohort.

Methods: We retrospectively reviewed patients undergoing ablation and free flap reconstruction or transoral robotic surgery (TORS) for primary head and neck squamous cell carcinoma (HNSCC) at a tertiary institution between 2017 – 2021. Rate of complications were compared between both groups. Variables that were found to be significant at the $\alpha = 0.05$ level in the univariable model were considered for the multivariable regression analysis to estimate odds ratio (OR).

Results: 508 patients met inclusion criteria. Free flap reconstruction constituted 27.4% of patients and TORS constituted 72.6% of patients. Neoadjuvant immunotherapy was administered in 87/508 (17.1%) of patients. Durvalumab was administered in 22 patients and Nivolumab in 65 patients. Patients receiving neoadjuvant immunotherapy were significantly less likely to have lymph node metastasis (66.7% vs 77.2%, $p = 0.043$) and had decreased rates of lymphovascular invasion (LVI) (17.2% vs 33.5%, $p = 0.003$) and perineural invasion (PNI) (18.4% vs 29.5%, $p = 0.036$) compared to patients undergoing upfront surgery. There was no statistically significant difference in surgical (20.7% vs 21.9%, $p = 0.811$), medical (10.3% vs 6.4%, $p = 0.193$), or overall complications (25.3% vs 25.9%, $p = 0.907$) between patients receiving neoadjuvant immunotherapy and upfront surgery. Predictors of increased overall complications included non-white race (OR, 2.32; 95% CI, 1.31 – 4.10; $p = 0.004$), advanced pathologic T classification (T4 versus T1; OR, 4.17; 95% CI, 1.11 – 15.7; $p = 0.035$), and current/former smoking history (OR, 2.25; 95% CI, 1.40 – 3.62; $p < 0.001$).

Conclusions: Neoadjuvant immunotherapy does not increase risk of overall complications. Definitive surgery can be conducted safely after neoadjuvant immunotherapy.

AHNS10: SUCCESS AND OUTCOMES FOLLOWING A SECOND SALVAGE ATTEMPT FOR FREE FLAP COMPROMISE: IS IT WORTHWHILE

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Introduction: Incidence of perioperative free flap compromise is low with successful salvage in up to 70%. When the flap is compromised a second time, the value of intervening is unknown. We assessed the outcomes of a second revascularization attempts for compromised free flaps.

Methods: Multi-institutional retrospective chart review 2000-2020. Of 3,510 flaps, 77 successfully salvaged once, became compromised a second time and underwent attempted salvage. Outcomes were analyzed

Results: Surgical indication: malignancy 80%, other 10.1%, osteoradionecrosis 8.9%. Reconstructive site: oral cavity 48%, mandible 11%, other 9.0%, oropharynx 8.9%, scalp 8.9%, maxilla 8.9%, larynx 5.4%. Flap types requiring second revision: RFFF 29%, fibula 26%, ALT 22%, scapula 9.1%, latissimus dorsi 6.5%, other 6.5%. Cause of initial flap compromise: venous congestion 46%, arterial thrombosis 30%, other 24%. Cause of secondary flap compromise: recurrent arterial thrombosis 47%, recurrent venous congestion 35%. Other 18%. Heparin administered to 43% of patients after first successful salvage with 92% on heparin during second flap compromise. 64% of patients were on heparin after second salvage, they demonstrated a 57% survival rate versus patients not on heparin 43%, flap survival $p=0.52$. Flap outcomes following second salvage: 66% partial or total necrosis, 34% survived. Flap type did not impact survival after second salvage attempt.

Conclusions: Second salvage surgeries successfully perfused 34% of flaps. There was no correlation noted for the type of flap used and survival. Post-operative heparin did not appear to increase flap survival. Second salvage flap surgery may be valuable in patients with limited reconstructive options.

AHNS11: WPOI-5 CAN BE ACCURATELY IDENTIFIED DURING INTRAOPERATIVE CONSULTATION AND ALSO PREDICTS OCCULT CERVICAL METASTASES

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Introduction: WPOI-5 is an American Joint Committee on Cancer (**AJCC**) 8th Edition registry data collection variable and a reporting element in the College of American Pathologists (**CAP**) synoptic for oral cancers. Here, we demonstrate that WPOI-5 can also predict occult cervical metastases (**OCM**). Elective neck dissection (**END**) is usually performed when depth of invasion (**DOI**) ≥ 4 mm, which might be determined during frozen section. Intraoperative identification of WPOI-5 may impact intraoperative decisions, especially if DOI < 4 mm. We show that WPOI-5 can be accurately identified during intraoperative consultations.

Methods: The prospective arm is a single institution study examining concordance between intraoperative and final

pathology WPOI identification. Thirty patients from our institution were accrued over a period of 26 months. All patients underwent surgical resection of biopsy-proven oral cavity squamous cell carcinoma (**OCSCC**) (primary or recurrent). Affected subsites in the oral cavity included the oral tongue, floor of mouth, gingiva, buccal mucosa, hard palate, and retromolar trigone. Intraoperative frozen section findings were recorded and compared with corresponding permanent section results by a single pathologist with expertise in head and neck pathology. Tumors were classified as either non-aggressive (WPOI-3), WPOI-4, or WPOI-5. The retrospective arm involved 228 OCSCC patients, pT1/pT2 cN0 (**AJCC 8th Edition**) treated with END; these specimens were evaluated for occult cervical metastases and WPOI.

Results: Of the 30 tumor samples evaluated prospectively, 7 are WPOI-5, 10 are WPOI-4, and 13 are non-aggressive on permanent pathology. Intraoperative consultation correctly assigned WPOI in 25 of 30 cases. The most common misidentification was "nonaggressive" on frozen to WPOI-4 on permanent (n = 4). With respect to identifying WPOI-5, the accuracy, sensitivity, and specificity are 96.7%, 85.7%, and 100.0%, respectively (**Table 1**). In the retrospective arm, WPOI-5 was significantly predictive of OCM in 79 pT1 patients as compared to WPOI-4 / WPOI-3 ($p < 0.0001$) (**Table 2**). No significance was seen for pT2 OCSCC. There were 20 pT1 patients with DOI < 4 mm: 2 were WPOI-5 and both had OCM. There were 59 pT1 patients with DOI ≥ 4 mm: 24 were WPOI-5 and 11 of them had OCM.

Conclusions: There is a high accuracy of identifying WPOI-5 on frozen section; sampling error does not significantly impact its identification. Due to the significant risk of OCM, including the subgroup not usually included in END (DOI < 4 mm), intraoperative identification of WPOI-5 in pT1 patients may also guide surgical decision-making in regard to management of regional lymph nodes. In addition, as there is a high risk of locoregional recurrence associated with WPOI-5 cancers, intraoperative identification of WPOI-5 may have implications for the extent of tumor resection.

Table 1: Accuracy of WPOI-5 Identification During Intraoperative Consultation

Statistic	Value	95% CI
Sensitivity	85.71%	42.13% to 99.64%
Specificity	100.00%	85.18% to 100.00%
Positive Likelihood Ratio		
Negative Likelihood Ratio	0.14	0.02 to 0.88
Disease prevalence (*)	23.33%	9.93% to 42.28%
Positive Predictive Value (*)	100.00%	
Negative Predictive Value (*)	95.83%	78.93% to 99.30%
Accuracy (*)	96.67%	82.78% to 99.92%

Table 2: Occult Metastases for pT1/pT2 cN0 by WPOI (N = 228) (%)

		WPOI-5 (%)	WPOI-4 / WPOI-3 (%)	p
pT1	pN0 63 (79.7)	13 (50)	50 (94.3)	< 0.0001
	pN+ 16 (20.3)	13 (50)	3 (5.7)	
	Total 79 (100)	26 (100)	53 (100)	
pT2	pN0 116 (77.9)	25 (71.4)	91 (79.8)	0.4159
	pN+ 33 (22.1)	10 (28.6)	23 (20.2)	
	Total 149 (100)	35 (100)	114 (100)	

AHNS12: THROMBOPROPHYLAXIS AFTER MAJOR HEAD AND NECK SURGERY IN PATIENTS WITH HEAD AND NECK CANCER

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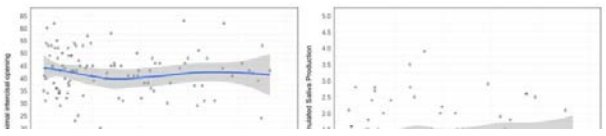
Background: Post-operative venous thromboembolism (VTE) is a major preventable cause of morbidity and mortality. The risk may be greater in patients who undergo major surgery for head and neck cancer compared to other otolaryngological operations, however the use of thromboprophylaxis varies among surgeons. The objective of this study was 1) to utilize a large database to determine the prevalence of VTE in head and neck cancer and 2) to compare the efficacy and cost-effectiveness of prophylactic heparin and enoxaparin.

Methods: The TriNetX Research Network was utilized to identify patients with a diagnosis of head and neck cancer treated with surgery between 2011-2021. The prevalence of VTE in the first 30 days and time on prophylaxis following surgery were obtained.

A break-even analysis was performed. The costs of anticoagulant agents were obtained from our institution's drug wholesaler. A range of reported VTE rates and VTE-related medical costs were determined from existing literature. The absolute risk reduction (ARR) was the percentage by which a prophylactic measure must reduce the rate of VTE in order to make it economically justifiable.

Results: A cohort of 26,071 patients were included in the analysis. The mean age was 62.3 years and 69% were male. 49.0% did not receive thromboprophylaxis, while 20.5% were prescribed heparin, 25.2% enoxaparin, and 5.3% were prescribed other anticoagulant agents or a combination. Those on heparin or enoxaparin remained on therapy for an average of 6.8 and 4.8 days, respectively. Patients prescribed thromboprophylaxis versus those who were not had significantly increased rates of hyperlipidemia ($p = 0.02$), ischemic heart disease, heart failure, cerebrovascular disease, COPD, and hypertension ($p < 0.0001$). In aggregate, there were 566 cases (2.17%) of VTE. The rate was 1.43% in the non-thromboprophylaxis group, and 2.47% and 2.11% in those prescribed heparin and enoxaparin, respectively. There was no significant difference in prevalence of VTE between patients prophylactically treated with heparin versus enoxaparin. Additionally, there were no significant differences in comorbidities between those who were not anticoagulated and experienced VTE and those who were with the same outcome.

At $0.40 - $3.91 per dose, heparin was determined to be cost-effective if the VTE rate decreased by an ARR of 0.06% - 0.58%. At $3.38 - $30.07 per dose, enoxaparin would be cost-effective if it decreased the VTE rate by at least 0.17% - 1.48% (Table 1).



Conclusion: Post-surgical head and neck cancer patients with increased comorbidities were more likely to be prescribed thromboprophylaxis and experience VTE, though the overall rate of VTE in this cancer population remains low. The group that did not receive thromboprophylaxis and went on to develop VTE represents a high-risk group and potential area for intervention. The use of heparin was equally effective while providing cost savings as compared to enoxaparin. Evaluating different

prophylaxis regimens and further risk stratification among patient populations may allow for effective and cost-efficient prophylaxis.

AHNS13: CLINICIAN-GRADED AND PATIENT-REPORTED SWALLOWING OUTCOMES BY EAT AND EXERCISE STATUS DURING OROPHARYNGEAL RADIOTHERAPY: PRELIMINARY RESULTS FROM A PROSPECTIVE REGISTRY

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Importance: Using prospective registry data, the investigators recently replicated their published 'use it or lose it' analysis (2013) confirming independent benefit of EAT and swallowing EXERCISE adherence during radiotherapy (RT) on oral intake outcomes. In a contemporary cohort of patients with oropharyngeal cancer (OPC) treated with RT, functional benefit of two pharyngeal activities performed by patients was confirmed: those who maintained PO (oral intake; EAT) and/or self-reported adherence to swallowing EXERCISE were more likely to eat solid foods by 3-6 months after treatment, while patients who EAT during RT expectedly had the shortest feeding tube dependence.

Objective: To extend the previous work by examining the relationship of EAT and EXERCISE using validated, clinician-graded (per videofluoroscopy) and patient-reported swallowing outcomes.

Design: Secondary analysis of the prospective oropharynx registry.

Setting: Single institution comprehensive cancer center.

Participants: 595 patients treated with primary RT (19%, 111) / chemoradiation (CRT; 73%, 434) or primary transoral robotic surgery (TORS)+RT/CRT (8%, 50) for OPC.

Interventions or Exposures: Primary exposure variables included (1) EAT: oral intake status at end of RT (nothing by mouth/NPO; partial PO [PO with tube supplement]; full PO); and (2) swallow EXERCISE adherence (non-adherent vs partial/full adherence) during RT.

Main Outcomes: Clinician-graded dysphagia severity grade and prevalence (per the videofluoroscopic Dynamic Imaging Grade of Swallowing Toxicity; DIGEST) and patient-reported MDADI were prospectively collected at baseline and 3-6 months post-RT. Multiple linear regression, ordinal, and logistic regression models were analyzed adjusting for tumor location, baseline dysphagia, chemotherapy, N and T stage.

Results: At the end of RT, 9% of patients were NPO (55), 19% partial PO (115), 71% full PO (425) and 57% (340) reported adherence to swallow exercises. In univariate models, composite MDADI was significantly associated with EAT at baseline (β=2.79, 95%CI:1.07-4.51, p=0.002) and 3-6 months (β=6.28, 95%CI:4.24-8.32, p<0.001; mean MDADI±SD: NPO:73±12; partial PO:73±17; full PO:83±13) and with EXERCISE at 3-6 months (β=4.18, 95%CI:1.39-7, p=0.003; mean MDADI±SD: non-adherent:77±16; adherent:82±14). After multivariate adjustment, MDADI associations with EAT were maintained (β=6.25, 95%CI:1.49-11, p=0.01) while EXERCISE was not (β=2.27, 95%CI:-0.46-5, p=0.1). Moderate-severe dysphagia (per videofluoroscopy DIGEST grade≥2) prevalence at 3-6 months was lowest in patients who were full PO at the end of RT (DIGEST ≥2: 12%, 54/425; partial PO: 23%, 27/115; NPO: 20%, 11/55; p=0.004) but differences were not identified between EXERCISE adherence groups (non-adherent: 16%, 42/255; adherent: 15%, 50/340, p=0.52). In univariate models, DIGEST associated with EAT at baseline (OR:0.75, 95%CI:0.57-0.99, p=0.04) and 3-6 months (OR: 0.56, 95%CI:0.4-0.8, p<0.001) but this was not maintained in multivariate modelling (EAT OR:0.58, 95%CI:0.27-1.23, p=0.16).

Conclusions: These prospective registry data further extend findings of prior work that support independent benefit of EAT and swallowing EXERCISE adherence during RT, now supported with broader domains of swallowing function using validated swallow outcome measures. Different patterns of benefit were seen depending on the outcome measure with results herein supporting better swallow-related QOL at 3-6 months among patients who EAT independent of their EXERCISE adherence, but not visa versa.

AHNS14: EVALUATION OF A DEFICIT ACCUMULATION FRAILTY INDEX AS A PREDICTOR OF OUTCOMES IN HEAD AND NECK CANCER PATIENTS.

Axel Sahovaler; Susie Su; Sharon Tzelnick; John de Almeida; Ralph Gilbert; Jonathan Irish; Xu Wei; Shabbir Alibhai; David Goldstein; University of Toronto

Introduction: Many tools have been used to try to risk stratify older patients, with a growing body of literature in head and neck surgery that demonstrates the importance of measuring frailty to aid in the identification of patients at risk of complications, increased length of stay (LOS) and discharge to alternative levels of care. There are two main conceptual models of frailty, one being a phenotypic model and the other being the deficit accumulation model. The deficit accumulation model incorporates more deficits than the phenotypic model and thus, may be a better tool to predict adverse outcomes following major head and neck surgery.

Objective: Develop a deficit accumulation frailty score to measure frailty and evaluate whether there is an association between the deficit accumulation frailty score with post-operative complications and length of stay and secondarily to compare its ability to predict these outcomes with that of the previously evaluated phenotypic model of frailty.

Methods: A prospective cohort study was performed with patients undergoing major head and neck cancer procedures between December 2011 and April 2014 at a referral center. Patients frailty was assessed according to Fried's Frailty Score (-FFS- a phenotypic model) and a deficit accumulation model (DAM). The DAM was created selecting rigorous criteria such as; association with health status, prevalence increase with age, cover a range of systems. A total of 40 deficits were included and expressed as a ratio. The outcomes included LOS, complications within 30 days of surgery, and overall survival. Complications were assessed based on having any complication, as well as type (i.e. medical vs surgical complications) and grade of complication (Clavien-Dindo grading system).

Results: A total of 274 patients were enrolled. The mean age of the entire cohort was 67.8 years (range 50 to 88 years) with 96 patients aged 55 to 64 and 129 aged 65 and older. In univariate models, neither the FFS or DAM were significant predictors of overall complications. However, on multivariate analysis both indices were independent predictors for medical complications while controlling for tumor site, age and operative hours (p=0.046). None of them was significant for surgical complications. When

adjusting for adjusting for tumor site, free flap and operative hours the DAM was an independent predictor of increased LOS (p=<0.001). Similarly, when controlling for age, cancer stage and sex, DAM was also significant (p=0.041).

Conclusion: We present a direct comparison of these models, constructing a cumulative model following specific criteria and a prospective referral center database. The cumulative model performed better predicting medical complications, LOS and survival compared with the phenotypical model. We hope that frailty research in head and neck cancer continues to evolve, aiming to endorse the importance of investigating frailty as a method and to incorporate it routine practice.

AHNS15: FUNCTIONAL OUTCOMES OF OROPHARYNGEAL RESECTION AND FREE FLAP RECONSTRUCTION AFTER HEAD AND NECK RADIATION: A MULTI-INSTITUTIONAL STUDY

Patrick Tassone, MD[1]; Margaret Wieser[1]; Alyssa Givens[2]; Zachary Elliott[2]; Ramez Philips, MD[2]; Joseph Curry, MD[2]; Louis-Xavier Barrette[3]; Steven Cannady, MD[3]; Chenge Mahomva, MD[4]; Eric Lamarre, MD[4]; Brandon Prendes, MD[4]; Katelyn Robillard, PhD[5]; Larissa Sweeny, MD[5]; [1]University of Missouri; [2]Thomas Jefferson University; [3]University of Pennsylvania; [4]Cleveland Clinic Foundation; [5]Louisiana State University

Importance: Patients with recurrent or second primary oropharyngeal cancer can achieve survival benefit from surgical salvage, and often require simultaneous free tissue transfer reconstruction in this setting. Resection and reconstruction can have significant impact on function, leading to long-term tube dependence.

Objective: Primary objective: describe rates of tracheostomy and gastrostomy tube dependence one year after oropharyngeal resection and free flap reconstruction among patients with prior head and neck radiation. Secondary objective: evaluate for patient, tumor, and treatment factors associated with tube dependence.

Design: Retrospective, multi-institutional cohort study. Patients treated from August 2003 - June 2020. Average follow-up 21.4 months.

Setting: Five tertiary care referral centers.

Participants: Adult patients undergoing resection and simultaneous free flap reconstruction for oropharyngeal squamous cell carcinoma after prior head and neck radiation. Consecutive sample of 89 patients were included.

Main Outcome and Measures: Primary outcomes were gastrostomy tube dependence and presence of tracheostomy or tracheostoma one year after surgery. Univariable and multivariable logistic regression performed to identify patient, tumor, and treatment factors associated with tube dependence as binary outcomes.

Results: All patients underwent oropharyngectomy and free flap reconstruction; 9 (10%) underwent segmental mandibulectomy and 18 (20%) underwent total laryngectomy as part of their tumor extirpation. After surgical salvage and free flap reconstruction, 51 patients (57%) were alive at 12 months, with median overall survival 23.9 months. Among patients alive at 12 months, 22 (43%) were at least partially-dependent on gastrostomy tube, and 15 (29%) had either tracheostomy tube or tracheostoma. On multivariable logistic regression analysis, patients undergoing total laryngectomy were significantly association with long-term gastrostomy tube (OR 7.74, 95% CI 1.32-66.0, p=0.033). Long term tracheostomy or tracheostoma was significantly associated with preoperative gastrostomy (OR 7.12, 95% CI 1.67-36.9, p=0.011).

Conclusions and Relevance: Even among long-term survivors after salvage oropharyngeal resection and free flap reconstruction, rates of tube dependence are significant. This multi-institutional review is the largest such study to date, and may help inform patient discussions and shared decision making in this challenging patient population.

AHNS17: OBJECTIVE MEASURES OF TRISMUS AND SALIVATION POORLY PREDICT PATIENT-REPORTED OUTCOMES FOLLOWING RADIATION FOR HEAD AND NECK CANCER

Sallie M Long, MD[1]; Annu Singh, BDS[2]; Amy L Tin, MA[3]; Bridget O'Hara, BSN, RN[2]; Marc A Cohen, MD, MPH[4]; Nancy Lee, MD[5]; David G Pfister, MD[6]; Tony Hung, MD, MBA, MSCR[6]; Richard J Wong, MD[4]; Andrew J Vickers, PhD[3]; Cherry L Estilo, DMD[2]; Jennifer R Cracchiolo, MD[4]; [1]NewYork-Presbyterian Hospital/ Weill Cornell; [2]Dental Service, Memorial Sloan Kettering Cancer Center; [3]Health Outcomes Research Group, Department of Epidemiology and Biostatistics, Memorial Sloan Kettering Cancer Center; [4]Head and Neck Service, Department of Surgery, Memorial Sloan Kettering Cancer Center; [5]Department of Radiation Oncology, Memorial Sloan Kettering Cancer Center; [6]Department of Medicine, Medical Oncology, Memorial Sloan Kettering Cancer Center

Background: Xerostomia and reduced mouth opening negatively impact quality-of-life (QoL) following radiation treatment (RT) for head and neck cancer, but studies directly correlating quantitative measures of function with patient-reported outcomes (PROs) are lacking. The primary aim of this study is to correlate objective measures of salivary gland and oral cavity functions (stimulated and unstimulated salivary flow, maximal interincisal opening [MIO]) with subjective PRO scales on salivation and eating using a validated PROs instrument. A secondary aim is to describe trends in objective and PRO measures over time following RT.

Methods: 116 patients who underwent RT for head and neck cancer between January 2016 and March 2021 were identified. Patients had pre-treatment MIO and saliva measurements, at least one post-RT measurement, and a completed PROs questionnaire within 6 months of the post-RT measurement. Three independently scored PROs scales from the FACE-Q Head and Neck Cancer measure were analyzed (with higher scores reflecting better outcome): 1) Eating and Drinking, 2) Eating Distress, and 3) Salivation. To determine how much of the variation in PROs scores could be explained by objective measures, univariable linear regression models were performed for each PRO against each objective measure, and coefficients of determination (R^2) were reported. Trends in objective and subjective measures over time were plotted using local weighted smoothing regression analysis.

Results: 113 patients were analyzed with a male predominance (n=87, 77%) and a median age of 61 years (IQR 53, 68). The majority had oropharynx tumors (n=64, 57%). Approximately one-third of patients underwent neck dissection (n=33, 29%), of whom 21 patients had dissection of level 1B. The R^2 for Eating Distress and Eating and Drinking paired with stimulated saliva was 5.0 and 9.6%, respectively. R^2 for unstimulated saliva was 5.3 and 6.8%, respectively. For the Salivation scale, stimulated and unstimulated saliva correlations were 8.5 and 13.8%, respectively. R^2 for MIO against the PRO scores was 8.3% for Eating Distress and 10.4%

for Eating and Drinking. MIO and saliva production (stimulated and unstimulated) remained relatively stable over time following RT. Eating and Drinking scores increased from 62 (95% CI 50, 74) immediately after RT to 88 (95% CI 80, 96) at year 1 prior to stabilizing. Eating Distress scores similarly increased from 55 (95% CI 42, 69) immediately after RT to 90 (95% CI 81, 100) at year 1 prior to stabilizing. Salivation scores remained constant over time (64 [95% CI 49, 79] immediately after RT and 64 [95% CI 54, 75] at year 1 after RT).

Conclusion: Objective measures of oral cavity and salivary function only explain a small fraction of changes in PRO scales built to measure these endpoints. Objective measures are relatively stable over time following RT, while PROs on Eating and Drinking and Eating Distress scales improve for the first year before stabilizing. This study highlights the importance of integrating PRO measures in head and neck cancer care. Future directives include creation of normative data trends and targeted interventions.

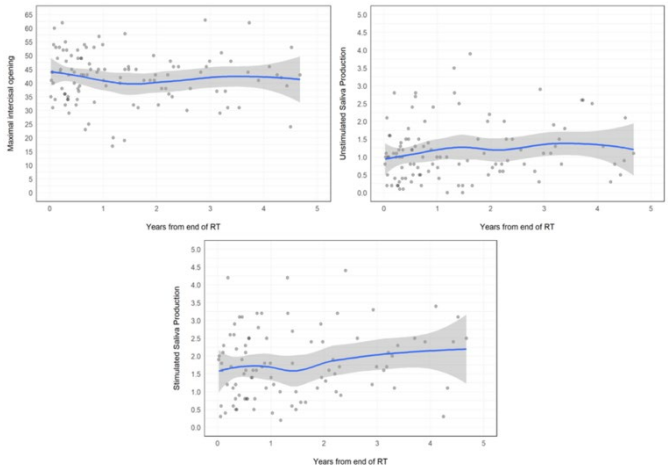

Figure 1. Objective measures following RT

Table 1. Comparison of Study Groups

	Overall	Pre-Intervention	Post-Intervention	P value
Average Age (Yrs.)	79.9	79.7	80.1	0.62*
Male / Female Predominance, n (%)				
Male	20 (33.3%)	19 (63.3%)	21 (70.0%)	0.58**
Female	40 (66.7%)	11 (36.7%)	9 (30.0%)	
Patients per Surgeon				
A	31 (51.7%)	16 (53.3%)	15 (50.0%)	>0.99**
B	14 (23.3%)	7 (23.3%)	7 (23.3%)	
C	8 (13.3%)	4 (13.3%)	4 (13.3%)	
D	7 (11.7%)	3 (10.0%)	4 (13.3%)	
Prior radiation, n (%)				
Yes	18 (30.0%)	7 (23.3%)	11 (36.7%)	0.26**
No	42 (70.0%)	23 (76.7%)	19 (63.3%)	
Free Flap Surgery				
Yes	33 (55.0%)	16 (53.3%)	17 (56.7%)	0.8**
No	27 (45.0%)	14 (46.7%)	13 (43.3%)	
Primary Site				
Oral Cavity	28 (46.7%)	15 (50.0%)	13 (43.3%)	0.9**
Oropharynx	6 (10.0%)	2 (6.7%)	4 (13.3%)	
Larynx	7 (11.7%)	4 (6.7%)	3 (10.0%)	
Cutaneous/Salivary	12 (20.0%)	5 (16.7%)	7 (23.3%)	
Thyroid	1 (1.7%)	0 (0.0%)	1 (3.3%)	
Sinonasal	3 (5.0%)	2 (6.7%)	1 (3.3%)	
Other	3 (5.0%)	2 (6.7%)	1 (3.3%)	
Disease Extent, n (%)				
Other***	6 (10.2%)	2 (6.7%)	4 (13.8%)	0.39**
Early	13 (22.0%)	5 (16.7%)	8 (27.6%)	
Late	40 (67.8%)	23 (76.7%)	17 (58.6%)	

* Student's T test
** Chi-squared test
*** Surgery done for a nonmalignant reason (ex: dysfunctional larynx, osteoradionecrosis, etc.)

AHNS18: IMPLEMENTING A PREOPERATIVE QUALITY IMPROVEMENT PROTOCOL FOR GERIATRIC HEAD AND NECK CANCER PATIENTS RESULTS IN DECREASED UNPLANNED READMISSIONS

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Background: Head and Neck cancer incidence is increasingly driven by cases diagnosed in the geriatric population. Geriatric patients are more susceptible to delirium, falls, and deconditioning in the post-operative period, resulting in greater functional decline, delayed recovery, and increased dependency. Increased length of stay, unplanned hospital readmission and increased dependency status burden the health care system. The American College of Surgeons released a Geriatric Surgery Verification Quality Improvement Program, but there are currently no guidelines specific to preoperative care of the geriatric head and neck cancer patient.

Methods: A quality improvement (QI) initiative was implemented for all head and neck cancer surgical patients on 10/01/2020 at a single tertiary care institution. Patients were selected into the QI initiative if over the age of 75 and undergoing surgery requiring greater than a 48-hour admission. This study assesses length of stay, unplanned 30-day readmission, and discharge location in patients who received this QI initiative (post-initiative group) compared to an age-matched historical cohort (pre-initiative group). In this QI initiative, all patients filled out a pre-operative modified geriatric assessment, and the patient and their identified caregiver received a personalized preoperative phone call explaining their upcoming surgery, inpatient stay, and post-operative expectations. A week prior to the patient's planned surgery, a "Geriatric Email" was sent to the multidisciplinary inpatient team (nursing, phyisician and dietary teams) alerting

them of the expected admission and pertinent information obtained in the pre-surgery assessment. Upon admission, a geriatric order set focused on tenants of geriatric health, such as: decreasing delirium events, nutrition supplementation and avoiding deconditioning was created for this QI initiative and exclusively utilized for these patients.

Results: 30 patients underwent the QI initiative between 10/01/2020 and 06/01/2021. There were no significant differences between the pre- and post-initiative groups' demographic variables including age, gender, surgeon, primary site, cancer stage, radiation history, or free flap at time of surgery (Table 1). There was a significantly decreased rate of 30-day unplanned readmissions in the post-initiative (16.7 %) versus the pre-initiative (40.0%) cohort ($p < 0.04$). Discharge to home was improved in the post initiative group, with a higher rate of skilled nursing facility discharge in the pre-initiative group (26.7%) versus the post-initiative group (10.0 %) (Table 2). There was no significant difference in length of stay between the two cohorts. When the two groups were broken into upper and lower quartiles for length of stay, the upper quartile mean length of stay was 10 days verses the post-intervention group at 6 days (Table 3).

Conclusions: In the patients undergoing our novel geriatric protocol, we observed less 30-day readmissions and a higher percentage of patients discharging to home as opposed to a skilled nursing facility. This project highlights the value of careful preoperative planning in this venerable patient population and the importance of optimization of inpatient variables that can improve hospital stay and diminish the risk of delayed recovery from major head and neck surgery.

Table 1. Comparison of Study Groups

	Overall	Pre-Intervention	Post-Intervention	P value
Average Age (Yrs.)	79.9	79.7	80.1	0.62*
Male / Female Predominance, n (%)				
Male	20 (33.3%)	19 (63.3%)	21 (70.0%)	0.58**
Female	40 (66.7%)	11 (36.7%)	9 (30.0%)	
Patients per Surgeon				
A	31 (51.7%)	16 (53.3%)	15 (50.0%)	>0.99**
B	14 (23.3%)	7 (23.3%)	7 (23.3%)	
C	8 (13.3%)	4 (13.3%)	4 (13.3%)	
D	7 (11.7%)	3 (10.0%)	4 (13.3%)	
Prior radiation, n (%)				
Yes	18 (30.0%)	7 (23.3%)	11 (36.7%)	0.26**
No	42 (70.0%)	23 (76.7%)	19 (63.3%)	
Free Flap Surgery				
Yes	33 (55.0%)	16 (53.3%)	17 (56.7%)	0.8**
No	27 (45.0%)	14 (46.7%)	13 (43.3%)	
Primary Site				
Oral Cavity	28 (46.7%)	15 (50.0%)	13 (43.3%)	0.9**
Oropharynx	6 (10.0%)	2 (6.7%)	4 (13.3%)	
Larynx	7 (11.7%)	4 (6.7%)	3 (10.0%)	
Cutaneous/Salivary	12 (20.0%)	5 (16.7%)	7 (23.3%)	
Thyroid	1 (1.7%)	0 (0.0%)	1 (3.3%)	
Sinonasal	3 (5.0%)	2 (6.7%)	1 (3.3%)	
Other	3 (5.0%)	2 (6.7%)	1 (3.3%)	
Disease Extent, n (%)				
Other***	6 (10.2%)	2 (6.7%)	4 (13.8%)	0.39**
Early	13 (22.0%)	5 (16.7%)	8 (27.6%)	
Late	40 (67.8%)	23 (76.7%)	17 (58.6%)	

* Student's T test
** Chi-squared test
*** Surgery done for a nonmalignant reason (ex: dysfunctional larynx, osteoradionecrosis, etc.)

Table 2. Quality Improvement Outcomes Measures

Outcome Measure	Pre-Intervention (n= 30)	Post-Intervention (n = 30)	P Value
Length of stay (median days)	6	5.5	0.27
30-day readmission, n (%)	12 (40.0%)	5 (16.7%)	0.04
Discharge disposition, n discharged to home (%)	22 (73.3%)	27 (90.0%)	0.09

Table 3. Length of Stay (LOS) by Quartile

Cohort	Median LOS (days)	Minimum LOS (days)	Lower Quartile Mean LOS (days)	Upper Quartile Mean LOS (days)	Maximum LOS (days)
Pre-Intervention (N = 30)	6	2	3	10	89
Post Intervention (N= 30)	5.5	2	4	6	16

AHNS12: THROMBOPROPHYLAXIS AFTER MAJOR HEAD AND NECK SURGERY IN PATIENTS WITH HEAD AND NECK CANCER

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Background: Post-operative venous thromboembolism (VTE) is a major preventable cause of morbidity and mortality. The risk may be greater in patients who undergo major surgery for head and neck cancer compared to other otolaryngological operations, however the use of thromboprophylaxis varies among surgeons. The objective of this study was 1) to utilize a large database to determine the prevalence of VTE in head and neck cancer and 2) to compare the efficacy and cost-effectiveness of prophylactic heparin and enoxaparin.

Methods: The TriNetX Research Network was utilized to identify patients with a diagnosis of head and neck cancer treated with surgery between 2011-2021. The prevalence of VTE in the first 30 days and time on prophylaxis following surgery were obtained.

A break-even analysis was performed. The costs of anticoagulant agents were obtained from our institution's drug wholesaler. A range of reported VTE rates and VTE-related medical costs were determined from existing literature. The absolute risk reduction (ARR) was the percentage by which a prophylactic measure must reduce the rate of VTE in order to make it economically justifiable.

Results: A cohort of 26,071 patients were included in the analysis. The mean age was 62.3 years and 69% were male. 49.0% did not receive thromboprophylaxis, while 20.5% were prescribed heparin, 25.2% enoxaparin, and 5.3% were prescribed other anticoagulant agents or a combination. Those on heparin or enoxaparin remained on therapy for an average of 6.8 and 4.8 days, respectively. Patients prescribed thromboprophylaxis versus those who were not had significantly increased rates of hyperlipidemia ($p = 0.02$), ischemic heart disease, heart failure, cerebrovascular disease, COPD, and hypertension ($p < 0.0001$). In aggregate, there were 566 cases (2.17%) of VTE. The rate was 1.43% in the non-thromboprophylaxis group, and 2.47% and 2.11% in those prescribed heparin and enoxaparin, respectively. There was no significant difference in prevalence of VTE between patients prophylactically treated with heparin versus enoxaparin. Additionally, there were no significant differences in comorbidities between those who were not anticoagulated and experienced VTE and those who were with the same outcome.

At $0.40 - $3.91 per dose, heparin was determined to be cost-effective if the VTE rate decreased by an ARR of 0.06% - 0.58%. At $3.38 - $30.07 per dose, enoxaparin would be cost-effective if it decreased the VTE rate by at least 0.17% - 1.48% (Table 1).

Table 1: Cost-effectiveness of VTE prophylaxis after major head and neck surgery

Drug	VTE Rate	Cost of Treating[a]	Cost of Drug[b]	Break-Even Rate	ARR
Heparin 5000 units	0.14% - 8%	$14,263	$8.40 - $82.11	0.081% - 7.42%	0.06% - 0.58%
Enoxaparin 40 mg	0.14% - 8%	$14,263	$23.66 - $210.49	0.026% - 6.52%	0.17% - 1.48%

[a]VTE-related medical costs in the first month following VTE, obtained from literature
[b]Drug costs obtained from our institution's online drug catalog, assuming 1 week of inpatient therapy

Conclusion: Post-surgical head and neck cancer patients with increased comorbidities were more likely to be prescribed thromboprophylaxis and experience VTE, though the overall rate of VTE in this cancer population remains low. The group that did not receive thromboprophylaxis and went on to develop VTE represents a high-risk group and potential area for intervention. The use of heparin was equally effective while providing cost savings as compared to enoxaparin. Evaluating different prophylaxis regimens and further risk stratification among patient populations may allow for effective and cost-efficient prophylaxis.

AHNS13: CLINICIAN-GRADED AND PATIENT-REPORTED SWALLOWING OUTCOMES BY EAT AND EXERCISE STATUS DURING OROPHARYNGEAL RADIOTHERAPY: PRELIMINARY RESULTS FROM A PROSPECTIVE REGISTRY

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Importance: Using prospective registry data, the investigators recently replicated their published 'use it or lose it' analysis (2013) confirming independent benefit of EAT and swallowing EXERCISE adherence during radiotherapy (RT) on oral intake outcomes. In a contemporary cohort of patients with oropharyngeal cancer (OPC) treated with RT, functional benefit of two pharyngeal activities performed by patients was confirmed: those who maintained PO (oral intake; EAT) and/or self-reported adherence to swallowing EXERCISE were more likely to eat solid foods by 3-6 months after treatment, while patients who EAT during RT expectedly had the shortest feeding tube dependence.

Objective: To extend the previous work by examining the relationship of EAT and EXERCISE using validated, clinician-graded (per videofluoroscopy) and patient-reported swallowing outcomes.

Design: Secondary analysis of the prospective oropharynx registry.

Setting: Single institution comprehensive cancer center.

Participants: 595 patients treated with primary RT (19%, 111) / chemoradiation (CRT; 73%, 434) or primary transoral robotic surgery (TORS)+RT/CRT (8%, 50) for OPC.

Interventions or Exposures: Primary exposure variables included (1) EAT: oral intake status at end of RT (nothing by mouth/NPO; partial PO [PO with tube supplement]; full PO); and (2) swallow EXERCISE adherence (non-adherent vs partial/full adherence) during RT.

Main Outcomes: Clinician-graded dysphagia severity grade and prevalence (per the videofluoroscopic Dynamic Imaging Grade of Swallowing Toxicity; DIGEST) and patient-reported MDADI were prospectively collected at baseline and 3-6 months post-RT. Multiple linear regression, ordinal, and logistic regression models were analyzed adjusting for tumor location, baseline dysphagia, chemotherapy, N and T stage.

Results: At the end of RT, 9% of patients were NPO (55), 19% partial PO (115), 71% full PO (425) and 57% (340) reported adherence to swallow exercises. In univariate models, composite MDADI was significantly associated with EAT at baseline (β=2.79, 95%CI:1.07-4.51, p=0.002) and 3-6 months (β=6.28, 95%CI:4.24-8.32, p<0.001; mean MDADI±SD: NPO:73±12; partial PO:73±17; full PO:83±13) and with EXERCISE at 3-6 months (β=4.18, 95%CI:1.39-7, p=0.003; mean MDADI±SD: non-adherent:77±16; adherent:82±14). After multivariate adjustment, MDADI associations with EAT were maintained (β=6.25, 95%CI:1.49-11, p=0.01) while EXERCISE was not (β=2.27, 95%CI:-0.46-5, p=0.1). Moderate-severe dysphagia (per videofluoroscopy DIGEST grade≥2) prevalence at 3-6 months was lowest in patients who were full PO at the end of RT (DIGEST ≥2: 12%, 54/425; partial PO: 23%, 27/115; NPO: 20%, 11/55; p=0.004) but differences were not identified between EXERCISE adherence groups (non-adherent: 16%, 42/255; adherent: 15%, 50/340, p=0.52). In univariate models, DIGEST associated with EAT at baseline (OR:0.75, 95%CI:0.57-0.99, p=0.04) and 3-6 months (OR: 0.56, 95%CI:0.4-0.8, p<0.001) but this was not maintained in multivariate modelling (EAT OR:0.58, 95%CI:0.27-1.23, p=0.16).

Conclusions: These prospective registry data further extend findings of prior work that support independent benefit of EAT and swallowing EXERCISE adherence during RT, now supported with broader domains of swallowing function using validated swallow outcome measures. Different patterns of benefit were seen depending on the outcome measure with results herein supporting better swallow-related QOL at 3-6 months among patients who EAT independent of their EXERCISE adherence, but not visa versa.

AHNS14: EVALUATION OF A DEFICIT ACCUMULATION FRAILTY INDEX AS A PREDICTOR OF OUTCOMES IN HEAD AND NECK CANCER PATIENTS.

Axel Sahovaler; Susie Su; Sharon Tzelnick; John de Almeida; Ralph Gilbert; Jonathan Irish; Xu Wei; Shabbir Alibhai; David Goldstein; University of Toronto

Introduction: Many tools have been used to try to risk stratify older patients, with a growing body of literature in head and neck surgery that demonstrates the importance of measuring frailty to aid in the identification of patients at risk of complications, increased length of stay (LOS) and discharge to alternative levels of care. There are two main conceptual models of frailty, one being a phenotypic model and the other being the deficit accumulation model. The deficit accumulation model incorporates more deficits than the phenotypic model and thus, may be a better tool to predict adverse outcomes following major head and neck surgery.

Objective: Develop a deficit accumulation frailty score to measure frailty and evaluate whether there is an association between the deficit accumulation frailty score with post-operative complications and length of stay and secondarily to compare its ability to predict these outcomes with that of the previously evaluated phenotypic model of frailty.

Methods: A prospective cohort study was performed with patients undergoing major head and neck cancer procedures between

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December 2011 and April 2014 at a referral center. Patients frailty was assessed according to Fried's Frailty Score (-FFS- a phenotypic model) and a deficit accumulation model (DAM). The DAM was created selecting rigorous criteria such as; association with health status, prevalence increase with age, cover a range of systems. A total of 40 deficits were included and expressed as a ratio. The outcomes included LOS, complications within 30 days of surgery, and overall survival. Complications were assessed based on having any complication, as well as type (i.e. medical vs surgical complications) and grade of complication (Clavien-Dindo grading system).

Results: A total of 274 patients were enrolled. The mean age of the entire cohort was 67.8 years (range 50 to 88 years) with 96 patients aged 55 to 64 and 129 aged 65 and older. In univariate models, neither the FFS or DAM were significant predictors of overall complications. However, on multivariate analysis both indices were independent predictors for medical complications while controlling for tumor site, age and operative hours (p=0.046). None of them was significant for surgical complications. When adjusting for adjusting for tumor site, free flap and operative hours the DAM was an independent predictor of increased LOS (p=<0.001). Similarly, when controlling for age, cancer stage and sex, DAM was also significant (p=0.041).

Conclusion: We present a direct comparison of these models, constructing a cumulative model following specific criteria and a prospective referral center database. The cumulative model performed better predicting medical complications, LOS and survival compared with the phenotypical model. We hope that frailty research in head and neck cancer continues to evolve, aiming to endorse the importance of investigating frailty as a method and to incorporate it routine practice.

AHNS15: FUNCTIONAL OUTCOMES OF OROPHARYNGEAL RESECTION AND FREE FLAP RECONSTRUCTION AFTER HEAD AND NECK RADIATION: A MULTI-INSTITUTIONAL STUDY

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Importance: Patients with recurrent or second primary oropharyngeal cancer can achieve survival benefit from surgical salvage, and often require simultaneous free tissue transfer reconstruction in this setting. Resection and reconstruction can have significant impact on function, leading to long-term tube dependence.

Objective: Primary objective: describe rates of tracheostomy and gastrostomy tube dependence one year after oropharyngeal resection and free flap reconstruction among patients with prior head and neck radiation. Secondary objective: evaluate for patient, tumor, and treatment factors associated with tube dependence.

Design: Retrospective, multi-institutional cohort study. Patients treated from August 2003 - June 2020. Average follow-up 21.4 months.

Setting: Five tertiary care referral centers.

Participants: Adult patients undergoing resection and simultaneous free flap reconstruction for oropharyngeal squamous cell carcinoma after prior head and neck radiation. Consecutive sample of 89 patients were included.

Main Outcome and Measures: Primary outcomes were gastrostomy tube dependence and presence of tracheostomy or tracheostoma one year after surgery. Univariable and multivariable logistic regression performed to identify patient, tumor, and treatment factors associated with tube dependence as binary outcomes.

Results: All patients underwent oropharyngectomy and free flap reconstruction; 9 (10%) underwent segmental mandibulectomy and 18 (20%) underwent total laryngectomy as part of their tumor extirpation. After surgical salvage and free flap reconstruction, 51 patients (57%) were alive at 12 months, with median overall survival 23.9 months. Among patients alive at 12 months, 22 (43%) were at least partially-dependent on gastrostomy tube, and 15 (29%) had either tracheostomy tube or tracheostoma. On multivariable logistic regression analysis, patients undergoing total laryngectomy were significantly association with long-term gastrostomy tube (OR 7.74, 95% CI 1.32-66.0, p=0.033). Long term tracheostomy or tracheostoma was significantly associated with preoperative gastrostomy (OR 7.12, 95% CI 1.67-36.9, p=0.011).

Conclusions and Relevance: Even among long-term survivors after salvage oropharyngeal resection and free flap reconstruction, rates of tube dependence are significant. This multi-institutional review is the largest such study to date, and may help inform patient discussions and shared decision making in this challenging patient population.

AHNS17: OBJECTIVE MEASURES OF TRISMUS AND SALIVATION POORLY PREDICT PATIENT-REPORTED OUTCOMES FOLLOWING RADIATION FOR HEAD AND NECK CANCER

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Background: Xerostomia and reduced mouth opening negatively impact quality-of-life (QoL) following radiation treatment (RT) for head and neck cancer, but studies directly correlating quantitative measures of function with patient-reported outcomes (PROs) are lacking. The primary aim of this study is to correlate objective measures of salivary gland and oral cavity functions (stimulated and unstimulated salivary flow, maximal interincisal opening [MIO]) with subjective PRO scales on salivation and eating using a validated PROs instrument. A secondary aim is to describe trends in objective and PRO measures over time following RT.

Methods: 116 patients who underwent RT for head and neck cancer between January 2016 and March 2021 were identified. Patients had pre-treatment MIO and saliva measurements, at least one post-RT measurement, and a completed PROs questionnaire within 6 months of the post-RT measurement. Three

independently scored PROs scales from the FACE-Q Head and Neck Cancer measure were analyzed (with higher scores reflecting better outcome): 1) Eating and Drinking, 2) Eating Distress, and 3) Salivation. To determine how much of the variation in PROs scores could be explained by objective measures, univariable linear regression models were performed for each PRO against each objective measure, and coefficients of determination (R^2) were reported. Trends in objective and subjective measures over time were plotted using local weighted smoothing regression analysis.

Results: 113 patients were analyzed with a male predominance (n=87, 77%) and a median age of 61 years (IQR 53, 68). The majority had oropharynx tumors (n=64, 57%). Approximately one-third of patients underwent neck dissection (n=33, 29%), of whom 21 patients had dissection of level 1B. The R^2 for Eating Distress and Eating and Drinking paired with stimulated saliva was 5.0 and 9.6%, respectively. R^2 for unstimulated saliva was 5.3 and 6.8%, respectively. For the Salivation scale, stimulated and unstimulated saliva correlations were 8.5 and 13.8%, respectively. R^2 for MIO against the PRO scores was 8.3% for Eating Distress and 10.4% for Eating and Drinking. MIO and saliva production (stimulated and unstimulated) remained relatively stable over time following RT. Eating and Drinking scores increased from 62 (95% CI 50, 74) immediately after RT to 88 (95% CI 80, 96) at year 1 prior to stabilizing. Eating Distress scores similarly increased from 55 (95% CI 42, 69) immediately after RT to 90 (95% CI 81, 100) at year 1 prior to stabilizing. Salivation scores remained constant over time (64 [95% CI 49, 79] immediately after RT and 64 [95% CI 54, 75] at year 1 after RT).

Conclusion: Objective measures of oral cavity and salivary function only explain a small fraction of changes in PRO scales built to measure these endpoints. Objective measures are relatively stable over time following RT, while PROs on Eating and Drinking and Eating Distress scales improve for the first year before stabilizing. This study highlights the importance of integrating PRO measures in head and neck cancer care. Future directives include creation of normative data trends and targeted interventions.

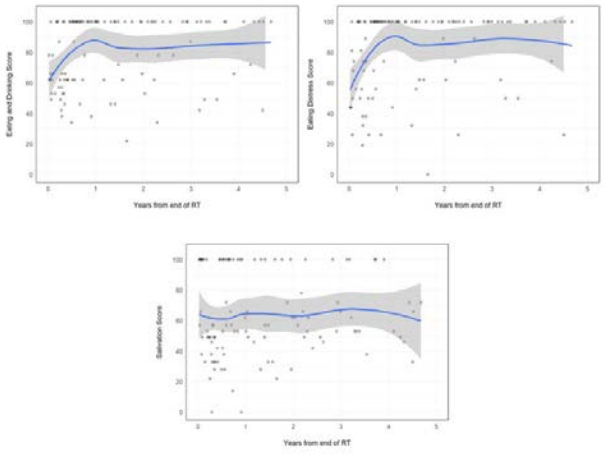

Figure 2. PRO scores following RT

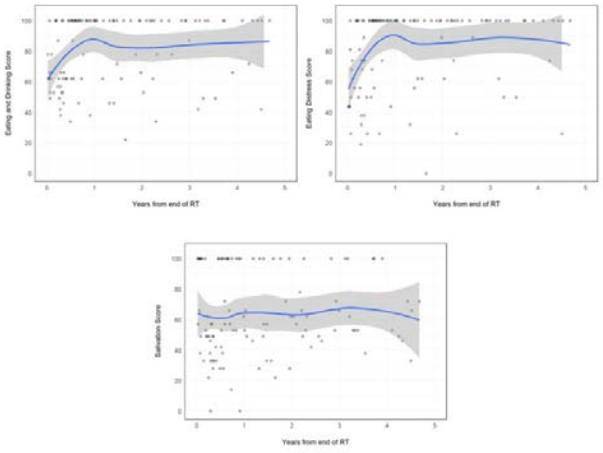

Figure 2. PRO scores following RT

AHNS18: IMPLEMENTING A PREOPERATIVE QUALITY IMPROVEMENT PROTOCOL FOR GERIATRIC HEAD AND NECK CANCER PATIENTS RESULTS IN DECREASED UNPLANNED READMISSIONS

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Background: Head and Neck cancer incidence is increasingly driven by cases diagnosed in the geriatric population. Geriatric patients are more susceptible to delirium, falls, and deconditioning in the post-operative period, resulting in greater functional decline, delayed recovery, and increased dependency. Increased length of stay, unplanned hospital readmission and increased dependency status burden the health care system. The American College of Surgeons released a Geriatric Surgery Verification Quality Improvement Program, but there are currently no guidelines specific to preoperative care of the geriatric head and neck cancer patient.

Methods: A quality improvement (QI) initiative was implemented for all head and neck cancer surgical patients on 10/01/2020 at a single tertiary care institution. Patients were selected into the QI initiative if over the age of 75 and undergoing surgery requiring greater than a 48-hour admission. This study assesses length of stay, unplanned 30-day readmission, and discharge location in patients who received this QI initiative (post-initiative group) compared to an age-matched historical cohort (pre-initiative group). In this QI initiative, all patients filled out a pre-operative modified geriatric assessment, and the patient and their identified caregiver received a personalized preoperative phone call explaining their upcoming surgery, inpatient stay, and post-operative expectations. A week prior to the patient's planned surgery, a "Geriatric Email" was sent to the multidisciplinary inpatient team (nursing, phyisician and dietary teams) alerting them of the expected admission and pertinent information obtained in the pre-surgery assessment. Upon admission, a geriatric order set focused on tenants of geriatric health, such as: decreasing delirium events, nutrition supplementation and avoiding deconditioning was created for this QI initiative and exclusively utilized for these patients.

Results: 30 patients underwent the QI initiative between

10/01/2020 and 06/01/2021. There were no significant differences between the pre- and post-initiative groups' demographic variables including age, gender, surgeon, primary site, cancer stage, radiation history, or free flap at time of surgery (Table 1). There was a significantly decreased rate of 30-day unplanned readmissions in the post-initiative (16.7 %) versus the pre-initiative (40.0%) cohort ($p < 0.04$). Discharge to home was improved in the post initiative group, with a higher rate of skilled nursing facility discharge in the pre-initiative group (26.7%) versus the post-initiative group (10.0 %) (Table 2). There was no significant difference in length of stay between the two cohorts. When the two groups were broken into upper and lower quartiles for length of stay, the upper quartile mean length of stay was 10 days verses the post-intervention group at 6 days (Table 3).

Conclusions: In the patients undergoing our novel geriatric protocol, we observed less 30-day readmissions and a higher percentage of patients discharging to home as opposed to a skilled nursing facility. This project highlights the value of careful preoperative planning in this venerable patient population and the importance of optimization of inpatient variables that can improve hospital stay and diminish the risk of delayed recovery from major head and neck surgery.

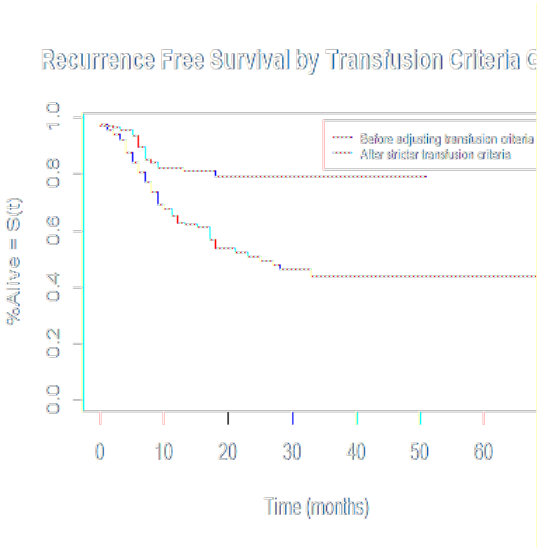

Table 2. Quality Improvement Outcomes Measures

Outcome Measure	Pre-Intervention (n= 30)	Post-Intervention (n = 30)	P Value
Length of stay (median days)	6	5.5	0.27
30-day readmission, n (%)	12 (40.0%)	5 (16.7%)	0.04
Discharge disposition, n discharged to home (%)	22 (73.3%)	27 (90.0%)	0.09

Table 3. Length of Stay (LOS) by Quartile

Cohort	Median LOS (days)	Minimum LOS (days)	Lower Quartile Mean LOS (days)	Upper Quartile Mean LOS (days)	Maximum LOS (days)
Pre-Intervention (N = 30)	6	2	3	10	89
Post Intervention (N= 30)	5.5	2	4	6	16

AHNS26: THE VALUE OF SECOND OPINIONS ON THYROID NODULE MANAGEMENT PROVIDED VIA DIRECT-TO-CONSUMER TELEMEDICINE SERVICE

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Introduction: Patients seek a second medical opinion when their diagnosis is uncertain or when the treatment choices they face are complicated, unpleasant, or involve risks. Second opinions are becoming increasingly common and result in greater patient satisfaction, reduce rates of elective surgery, and save healthcare system dollars. Direct-to-consumer (DTC) telemedicine companies provide consumers around-the-clock access to care for common, nonemergency conditions through phone and live video via webcam or smartphone applications. One study demonstrate that these telemedicine consultations frequently result in a major change in treatment. No studies exist in the literature specific to second opinion services via telemedicine in otolaryngology.

Study Design: Retrospective chart review

Methods: We conducted a retrospective review of virtual second opinion consults reviewed by one ENT physician via a private telemedicine service. The patient cases spanned from September 2011 to March 2021. These second opinion cases involved patients requesting second surgical consults regarding thyroid nodules. Information on diagnostic workup and surgical recommendations made by patient's original primary surgeon was collected for review by the telemedicine company. We compared these original workup and management decisions to all relevant guidelines published in the 2015 American Thyroid Association (ATA) Guidelines for thyroid nodules and differentiated thyroid cancer.

Results: 37 patient charts were reviewed—all of which were patients seeking care related to thyroid nodules. 28 patients were female (76%) and 9 (24%) were male, with ages ranging from 23-71 years. 23 of these patients were living within the United States but 9 were in Asia, 3 in Europe, 1 in Canada, and 1 in Africa. The majority of ATA guidelines were accurately followed. However, only 27 (73%) patients had TSH levels checked as per ATA guidelines. Fine needle aspiration was done per guidelines in 30 patients (81%) and molecular testing guidelines followed in 33 patients (89%). One patient was inappropriately guided toward surgery during her pregnancy. Overall, the surgical recommendations provided to patients were exactly in concordance with the guidelines in 27 (73%) cases. In 4 cases (11%) the surgical recommendations were against the published guidelines and in 6 cases (16%) the original recommendations were partially in agreement.

Conclusions: Virtual second opinion consults allow access to standard of care medical advice for patients all over the world. In our cohort of patients seeking virtual second opinions regarding

thyroid nodules, the workup and surgical recommendations initially completed by the original surgeon were in compliance with the majority of ATA recommendations. In situations where discrepancies in proper workup or surgical recommendations were apparent, the virtual second opinion consult was valuable in allowing for additional treatment consideration to guide the patient's medical decision making.

AHNS27: IMPACT OF HOSPITAL SAFETY NET BURDEN ON THYROID CANCER SURVIVAL

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Objectives: To determine the impact of hospital safety net burden on survival for thyroid cancer patients.

Study Design: Retrospective database review.

Methods: The National Cancer Database (NCDB) was used to identify patients with primary, invasive thyroid cancers between 2004-2016. Patients with missing clinicopathological data were excluded. Hospital safety-net burden was defined by percentile of uninsured/Medicaid thyroid cancer patients treated per year: <25th percentile for low safety-net burden hospitals (LBH), between 25-75th percentile for medium (MBH), and ≥75th percentile for high (HBH). Univariate and multivariate analyses were performed to investigate the relationships between hospital safety net burden and patient demographics, tumor characteristics, and treatments.

Results: We queried 114,947 thyroid cancer cases in total. On univariate analysis, HBH compared to LBH and MBH had higher rates of patients with Charlson-Deyo score of 3+ (1.0% vs. 0.7% vs. 0.9%, p<0.001) and AJCC Stage 4 (0.8% vs. 0.4% vs. 0.4%, p<0.001). Utilizing multivariate analysis, demographic factors associated with treatment at HBH included Black race (OR 1.17 [1.11-1.24], p<0.001), Hispanic ethnicity (OR 1.42 [1.35-1.50], p<0.001), and being from rural area (OR 1.64 [1.46-1.83], p<0.001). Furthermore, staging factors associated with treatment at HBH were clinical stage T3 (OR 1.14 [1.07-1.23], p<0.001), cT4 disease (OR 1.34 [1.02-1.76], p=0.034), and clinical stage N1 (OR 1.17 [1.09-1.25], p<0.001). Conversely, patients living in the highest income quartile zip codes (OR 0.47 [0.45-0.50], p<0.001) or in areas with the highest quartile of high school graduation rates (OR 0.61 [0.57-0.64], p<0.001) had decreased odds for treatment at HBH. Kaplan-Meier analysis showed 10 year overall survival was improved for LBH versus MBH and HBH (88.8% vs. 87.0% vs. 86.0%, p<0.001). Compared to LBH, we found significantly higher mortality in patients treated at MBH (HR 1.13, 95% CI 1.05-1.21, p=0.001) and HBH (HR 1.17, 95% CI 1.08-1.27, p<0.001).

Conclusions: Thyroid cancer patients of lower socioeconomic status (SES) and advanced disease are more often treated at HBH. Further study is warranted to investigate and address the issue of lower SES patients presenting with higher stages of thyroid cancer, likely contributing to the poorer outcomes experienced at HBH.

AHNS28: CAN AFIRMA® EXPRESSION ATLAS PROGNOSTICATE SUSPICIOUS AND MALIGNANT THYROID NODULES NODULES?

Will Thedinger, BA; Jagdish Dhingra, MD; Tufts Medical Center

Introduction: Afima ® Expression atlas (XA) assesses mRNA expression of gene variants and fusions in indeterminate and malignant thyroid nodules. It was expanded in March 2020 from its the original version created in 2018. It is designed to risk stratify Afirma Gene Sequencing Classifier (GSC) suspicious nodules and provide prognostic information in Bethesda V and VI nodules that do not undergo Afirma GSC testing. Afirma® XA measures 905 DNA variants and 235 RNA fusions in over 593 genes. We wanted to study the performance of Afirma XA test as a prognosticator in suspicious and malignant nodules in our practice.

Setting: Dedicated thyroid ultrasound fine needle biopsy clinic in a large community practice.

Methods: Retrospective review was performed on data collected on all thyroid nodules that underwent ultrasound-guided fine-needle biopsy between 6/27/18 to 8/30/21. Cytopathology reports utilized The Bethesda System for Reporting Thyroid Cytopathology (TBSRTC). Afirma® XA was obtained for all the TBSRTC grade 3 and 4 nodules that were suspicious on Afirma® Gene Sequencing Classifier (GSC) and on all TBSRTC category 5 and 6 nodules.

Results: A total of 1168 nodules underwent US guided FNA. There were 171 (14.6%) Indeterminate (ITN) nodules - 129 TBSRTC category 3 and 42 TBSRTC category 4. Adequate RNA material was available for GSC testing in 165/171 ITN nodules. Sixty-five out of 162 nodules were suspicious on Afirma® GSC testing. There were 27 (2.6%) TBSRTC category 5 and 6 nodules. Afirma® XA was run on these 93 nodules. Afirma-XA detected genomic alterations in 50/93 nodules (54%). TBSRTC category 6 had the highest percentage (81%) of positive XA results, compared to 67% in TBSRTC category 5, and 45% in TBSRTC category 3 and 4 (Indeterminate nodules) that were GSC suspicious. The most common genomic alteration in TBSRTC -3 and TBSRTC -4 GSC suspicious was NRAS:p.Q61R. TBSRTC -5 and B-6 were enriched with BRAFV600E variants and RET/PTC1 and RET/PTC3 fusions. Afirma XA also detected unique gene fusions such as BRAF_MKRN1 and EML4_NTRK3. Samples were then studied and found to have positive correlation with final histopathological grade and incidence of lymph node metastasis.

Conclusions: Afirma® XA is a relatively new tool which in addition to other mutational markers holds great promise in prognostication of suspicious and malignant nodules, and thereby help with surgical planning and adjuvant treatment

AHNS29: UPDATE ON SAFETY AND OUTCOMES OF 300 CONSECUTIVE TRANSORAL THYROIDECTOMY CASES

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Objective: As transoral endoscopic thyroidectomy vestibular approach (TOETVA) gains more prevalence in North America, it is imperative to continuously re-evaluate its safety and outcomes. We previously published the outcomes of our first 200 consecutive TOETVA cases, which showed that TOETVA had longer operative times than traditional transcervical approach thyroidectomy (TCA), but there was no significant difference in major complications between techniques. Herein, we re-evaluate the outcomes and safety of TOETVA with an additional cohort of 100 cases.

Methods: Retrospective review of TOETVA and TCA cases from August 2017 to June 2021 at an academic institution was performed. Patient demographics, BMI, and specimen pathology and size were compared between groups. Outcomes included

operative time, major complications of conversion from TOETVA to TCA, hematoma, permanent hypoparathyroidism and permanent recurrent laryngeal nerve (RLN) injury, and minor complications of temporary hypoparathyroidism, temporary RLN injury, seroma, infection and permanent mental nerve injury. Outcomes were compared between groups and between cohorts of the first 200 versus most recent 100 TOETVA cases.

Results: A total of 830 cases were included: 300 TOETVA and 530 TCA cases. The TOETVA group had a higher proportion of females (86.7% vs 80.8%, p=0.03), younger median age (40(16-71)yr vs 49(10-84)yr, p<0.01) and lower median BMI (26.7(17.2-54.2) vs 28.8(17.1-74.3), p<0.01). The proportion of patients with Graves' disease (TOETVA:15% vs TCA:13%) and mean maximum lobe size (TOETVA:5.3cm vs TCA:5.4cm) were comparable between groups, but the TCA group had a significantly larger proportion of pre-operative Bethesda category V/VI lesions (23% vs 14%, p<0.001). Overall, the median operative time was significantly longer for the TOETVA group for both lobectomy (125min vs 80min, p<0.001) and total thyroidectomy (180min vs 120min, p<0.001) and did not significantly change for the TOETVA group between the initial cohort of 200 cases and the most recent 100 cases. The overall rate of major complications was 1.7% in both groups. Only 2 TOETVA cases required conversion to open procedure (0.7%). A single case of permanent RLN injury occurred in the TCA group and a single case of permanent hypoparathyroidism occurred in the TOETVA group. A total of 7 cases of hematoma occurred following TCA (1.3%), with no incidences in the TOETVA group. The TOETVA group had a higher incidence of minor complications (14.3% vs 8.7%, p=0.02). The rates of temporary RLN injury (TOETVA:3.4% vs TCA:2.3%), temporary hypoparathyroidism (TOETVA:14.9% vs TCA:9.7%), seroma (TOETVA:1.4% vs TCA:1.3%) and infection (TOETVA:0.7% vs TCA:0.4%) were comparable between groups. The TOETVA group had 6 cases of permanent mental nerve injury, with only 1 of these occurring in the most recent 100 cases and 1 case of skin injury due to light-cord burn. No significant differences were found between the incidence of major and minor complications between the initial 200 and most recent 100 TOETVA cases.

Conclusions: TOETVA continues to have increased operative times, but similar rates of major complications compared to TCA, further supporting this approach as a safe option for thyroid surgery. Evaluation of outcomes and safety of TOETVA will continue as this cohort grows.

AHNS30: OPIOID PRESCRIBING IN PATIENTS UNDERGOING NECK DISSECTION FOR THYROID MALIGNANCY

Jennifer March; James Lim; Maisie Shindo; Oregon Health and Science University

Background: Opioid prescribing practices for endocrine surgery have been reported in several studies. Data is lacking on opioid needs when lateral neck dissection is performed in this patient population. Our group recently described an opioid reduction initiative for routine thyroidectomy and parathyroidectomy which included preoperative counseling, multimodality non-opioid pain management, and joint efforts between RNs and MDs in assessing and treating the pain in the acute postoperative period, and demonstrated significant a reduction in quantity of postoperative opioids prescribed. We expanded the application of these interventions to patients undergoing lateral neck dissection for thyroid malignancy to determine if opioid prescribing can be reduced for such procedures.

Methods: We performed a retrospective cohort study of 397 patients who underwent lateral neck dissection for management of thyroid malignancy at Oregon Health and Science University, with or without central compartment surgery, between 6/2011 and 4/2021. Group 1 contained 165 patients treated prior to implementation of our multimodal pain control initiative. Group 2 contained 232 patients treated after implementation of decreased opioid prescribing practices. We evaluated the quantity of opioids prescribed at discharge and refills requested. Since these procedures are performed by endocrine surgery, head and neck surgery and surgical oncology services at our institution, we performed a subgroup analysis to determine if opioid prescribing differed between the groups.

Results: Cohort characteristics were compared between the patients included in Group 1 and Group 2. There was no statistically significant difference in the distribution of patients based on gender, race, length of hospital stay, subtype of thyroid malignancy, and procedures performed. The median morphine milliequivalents (MME) prescribed at discharge in Group 1 was 225, compared to 0 for the patients in Group 2 after implementation of our initiative (p<0.0001). There was no statistically significant difference in the number of patients who requested opioid refills between the groups. All treating services had a statistically significant decrease in opioids prescribed at discharge after implementation of the protocol: median 225 MME in endocrine group 1 compared to 0 MME in endocrine group 2 (p<0.01), median 200 MME in H&N group 1 compared to 75 MME in H&N group 2 (p<0.01), and median 225 MME in surgical oncology group 1 compared to 67.5 MME in group 2 (p<0.01). After implementation of the protocol, 57% of patients were discharged without a prescription for opioids, compared to only 7% before we changed our practice (p=<0.00001). The pattern of decreased MME required for pain control was maintained regardless of the extent of surgery performed with unilateral neck dissection, unilateral neck dissection with central compartment surgery, bilateral neck dissection, and bilateral neck dissection with central compartment surgery all demonstrating a statistically significant decrease (p<0.05 for all).

Conclusions: There was a statistically significant decrease in opioid prescriptions at discharge after implementation of preoperative counseling and perioperative pain management strategies for patients undergoing lateral neck dissection for management of thyroid malignancy. Based on these results, the median need for these procedures is between 0-75 MME (10 tablets of 5mg oxycodone) for opioid naïve patients.

AHNS31: PATIENT COMPLIANCE WITH SURVEILLANCE OF THYROID NODULES CLASSIFIED AS ATYPIA OF UNDETERMINED SIGNIFICANCE

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Importance: Thyroid nodules classified as atypia of undetermined significance have a significant risk of malignancy and can be managed by surveillance or diagnostic surgery. There are currently no publications evaluating surveillance compliance.

Objective: To determine whether thyroid nodule surveillance compliance is influenced by patient demographics or plan type, and whether patient or nodule characteristics influence triage to surgery.

Design: Retrospective case series from 2010-2018.

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Setting: United States Military Health System.

Participants: 481 patients with a thyroid nodule fine-needle aspiration classified as atypia of undetermined significance for whom treatment and follow-up information was available.

Main Outcomes and Measures: Compliance with nodule surveillance and the influence of patient demographics, sonographic nodule characteristics and surveillance plan on compliance or triage to surgery.

Results: A total of 289 nodules were surveilled and 192 diagnostic lobectomies were performed. An initial surveillance plan was documented in 93% (268/289) and 86% (231/268) complied. The most common plans were repeat biopsy in 78% (210/268) or ultrasound in 20% (53/268). A second plan was documented in 88% (204/231) of those who complied. The most common plans were ultrasound in 87% (178/204) or repeat biopsy in 8% (17/204). Compliance with the second plan was 64% (130/204), significantly lower than with the first (OR 3.6, 95% CI: [2.3, 5.6], P < 0.0001). Only 45% (130/289) were surveilled twice. Age and gender did not significantly affect compliance rates. Compliance with primary care ultrasound surveillance was 40% (21/52), significantly lower than with a specialist (77% [137/179]; OR 4.8, 95% CI: [2.5, 9.3, P < 0.0001). In the surgical cohort, age was lower (47 vs 52, P = 0.0002), nodule size was greater (2.6 vs 2.0 cm, P < 0.0001), and internal vascularity was more common (80% vs 66%, P = 0.003). The risk of malignancy after diagnostic lobectomy was 38% (73/192).

Conclusions and Relevance: Compliance with surveillance of thyroid nodules classified as atypia of undetermined significance was poor in this military cohort. Ultrasound surveillance by a specialist may be more reliable than with primary care. Age, nodule size, and internal vascularity may have influenced providers towards recommending diagnostic lobectomy.

AHNS32: RISK FACTORS FOR THE DEVELOPMENT OF FISTULA FOLLOWING ORAL CAVITY COMPOSITE RESECTION WITH FREE FLAP RECONSTRUCTION

Jean-Nicolas Gallant[1]; Wenda Ye[1]; Madelyn Stevens[1]; Michael O□Brien[2]; Ansley Kunnath[2]; Siddarth Patel[2]; Margaret Mitchell[3]; Vivian Weiss[1]; Eben Rosenthal[1]; Young Kim[1]; James Netterville[1]; Kyle Mannion[1]; Alexander Langerman[1]; Sarah Rohde[1]; Michael Topf[1]; Robert Sinard[1]; [1]Vanderbilt University Medical Center; [2]Vanderbilt University; [3]Massachusetts Eye and Ear Infirmary

Introduction: Fistula following oral cavity composite resection (OCCR) and free flap (FF) reconstruction is a common yet understudied problem. The goal of this study is to leverage a large cohort of patients who underwent an OCCR for oral cavity squamous cell carcinoma (OCSCC) with FF reconstruction in order to better understand fistulas and factors that may lead to their development.

Methods: Retrospective case series of all OCCRs performed between 2000 and 2020 at a single quaternary care center. OCCRs were identified from a combination of billing and pathology databases. Manual and automated data extraction were used to obtain demographic, clinical, surgical, and pathologic data from the medical record. Fistulas, as defined by surgeons, were identified by a natural language search. Uni- and multi- variable analyses were performed to identify factors identified with fistula formation.

Results: 504 patients underwent an OCCR for OCSCC with FF reconstruction between 2005 and 2020. Ninety-two (18.3%) developed a fistula post-operatively. Fistulas were significantly associated with morbidity (e.g. increased readmission and FF failure rates) and mortality (e.g. decreased progression free and overall survival). On univariable analysis, no single patient-related (e.g. pre-operative albumin, history of diabetes), treatment related (e.g. previous treatment, extent of neck dissection), or tumor related (e.g. size, invasion) factors were associated with the development of a fistula. Multivariable analysis of previously described risk factors (e.g. smoking history, prior radiation, length of surgery) likewise demonstrated a trend (with regards to pack years of tobacco) but no significant association.

Conclusion: Despite refinements in surgical technique, fistula following OCCR for OCSCC with FF reconstruction remains a common problem, which often requires readmission to the hospital and frequently leads to worse oncologic outcomes. In this large retrospective case series, we could not identify any modifiable factors that could be used to address this problem. Further study is required to help reduce the rate of this complication and improve patient morbidity and mortality.

AHNS33: A MULTI-INSTITUTIONAL ANALYSIS OF LATE COMPLICATIONS IN SCAPULA, FIBULA, AND OSTEOCUTANEOUS RADIAL FOREARM FREE FLAPS

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Importance: Osteocutaneous free flaps have become the optimal method of reconstruction for most major bony head and neck defects. Nationally, the scapula free flap (SFF), fibula free flap (FFF), and osteocutaneous radial forearm free flap (OCRFFF) represent the most commonly utilized osseous flaps. Existing literature on long-term complications between these three donor sites has been limited by insufficient sample size of SFF or OCRFFF. Additionally, existing literature may underestimate the frequency of long-term complications due to inadequate follow-up.

Objective:

1) To compare late complications between patients receiving FFF, OCRFFF, and SFF in a large multi-institutional cohort.

2) To compare the prevalence of late complications based on minimum duration of follow-up.

Design: Retrospective analysis of patients with major osseous defects undergoing reconstruction with a FFF, OCRFFF, or SFF over a continuous timeframe between 2005-2019 with at least 6 months documented follow-up information.

Main Outcome and Measure: Patients were stratified based on the type of free flap performed. Baseline clinical factors were compared between groups using univariate tests. Evaluated long-

term complications included overall late wound complications, late surgical site infection (SSI), hardware exposure, hardware removal, plate fracture, bone graft fracture, and osteonecrosis. Clinical factors associated with these outcomes were analyzed using univariable and multivariable logistic regression. Additionally, the frequency of late complications by the minimum duration of follow-up was assessed.

Results: After exclusions, a total of 617 patients were available for analysis: 312 (50.6%) FFF, 230 (37.3%) OCRFFFF, and 75 (12.2%) SFF. Compared to SFF, FFF (Odds Ratio [OR]: 2.49, 95% Confidence Interval [CI] 1.36-4.55) and OCRFFF (OR: 2.13, 95% CI: 1.10- 4.12) were independently associated with a higher rate of overall long-term wound complications. An early wound complication was also associated with late wound complications (OR: 2.12, 95% CI: 1.42- 3.14). SFF were associated with the lowest rate of hardware removal, compared to either FFF (OR: 2.63, 95% CI: 1.14-6.03) or OCRFFF (OR: 2.42, 95% CI: 1.03- 5.70). An early wound complication was also associated with hardware removal (OR: 2.57, 95% CI: 1.70- 3.89). Rates of plate fracture, bone fracture, and osteonecrosis did not significantly differ between groups. The frequency of late complications increased as minimum duration of follow-up increased until about 36 months ($p < 0.001$).

Conclusions and Relevance: This multi-institutional study suggests that the long-term complication profile of SFF compares favorably with FFF and OCRFFF.

AHNS34: ANALYSIS OF EARLY AND LATE COMPLICATIONS OF MANDIBULECTOMY FREE FLAP RECONSTRUCTION, DOES THE SELECTIVE USE OF SOFT TISSUE ONLY FLAPS REDUCE COMPLICATIONS?

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Objective: The management of mandibulectomy patients requiring free tissue transfer for reconstruction remains a formidable challenge. Previous work has demonstrated a return to full oral competence and recovery of a pre-operative diet in only a fraction of patients. This study aims to evaluate the factors associated with early and late complications following mandible free flap reconstruction.

Subjects and Methods: This is a retrospective cohort study that included consecutive patients (n=68) undergoing mandibulectomy with subsequent reconstruction using vascularized free tissue transfer at a single institution from 2016-2021. Mandibular defects were categorized according to the Jewer classification, while free flaps were categorized as either osseous or nonosseous (i.e. soft tissue only). Analysis of patient characteristics, surgical variables, complications (early and late), and swallowing outcomes were performed.

Results: The sample was composed of mandibular defects mostly falling into one of three categories: H (n = 22, 32%), LC (n = 18, 26%), or LCL (n = 12, 18%). The majority of reconstructions performed used osseous free flaps (65%) while remaining reconstructions used vascularized soft tissue only (35%). Soft tissue flaps were used to reconstruct the following defects: H (n=18, 63%), L (n=5, 21%), LC (n=1, 4%). The majority (88%) of the soft tissue patients were edentulous. Additionally, 34% of all reconstructive free flaps were chimeric such that multiple, independent pedicles or perforator vessels were linked to a common source vessel. Overall, 71% of patients recovered some form of an oral diet with 35% achieving 100% PO status. Full oral competence was recovered in 45% of patients and was defined as the absence of anterior spillage or drool with demonstrated full labial closure and intact sucking ability. When stratified by mandibular defect, LCL patients had far greater risk of requiring additional surgeries for hardware or soft tissue complications after 90 days (LCL vs H: 39% vs 5%, $p = 0.01$). Additionally, LCL patients were less likely to regain 100% PO status compared to either H or LC patients (8% vs 50%, $p = 0.02$; 8% vs 44%, $p = 0.03$). A comparison of free flaps demonstrated a substantial increased risk of a complication requiring additional surgery after 90 days in osseous free flaps compared to those with only soft tissue (39% vs 4%, $p = 0.002$). In addition, soft tissue transfers demonstrated increased return to full oral competence compared to osseous flaps (54% vs 30%, $p = 0.045$), but no significant differences were seen in other swallowing outcomes. Acute complications (within 30 days) were not significantly different for soft tissue flaps and osseous flaps. Smoking status, diabetes, prior chemotherapy, and prior radiation therapy did not predict an increased risk of surgical complication or poorer swallowing outcomes.

Conclusion: Osseous flaps for mandibulectomy patients are considered the gold standard for reconstruction but increase the possibility of late complications, often related to hardware extrusion or failure. When feasible, soft tissue reconstruction of lateral mandibular defects in edentulous patients provides adequate vascularized tissue, avoids many late complications, and allows for improved or equivalent oral and swallowing rehabilitation.

AHNS35: EFFECT OF PERIOPERATIVE ANTITHROMBOTICS AND ANTICOAGULANTS ON POSTOPERATIVE HEMATOMA AND TRANSFUSION RATES IN HEAD AND NECK MICROVASCULAR FREE FLAP PROCEDURES

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INTRODUCTION: Antithrombotic medications are routinely used in the postoperative management of microvascular free flaps in head and neck reconstruction. However, there is no consensus in the literature on the optimal regimen, and studies have shown mixed results regarding the risk of postoperative hematoma. In this study, we aim to explore whether antiplatelet or anticoagulant therapy increase the risk of postoperative hematoma formation or transfusion requirement in patients undergoing free flap reconstruction.

METHODS: A multi-institutional retrospective chart review was performed on all patients who underwent a microvascular free flap of the head and neck between August 2013 to July 2021. Perioperative use of anticoagulation or antithrombotics, intra-operative heparin bolus, postoperative day 0 hypertension (systolic blood pressure (BP) > 150 or diastolic BP > 100 for two consecutive readings or systolic BP >200 once) and postoperative platelet count data were collected for each patient. Primary endpoints were rate of post-operative hematoma and rate of post-operative packed red blood cell transfusions. GraphPad Prism 9.2.0 was used to perform univariate and multivariate analysis reported with OR (95% CI), p-value.

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RESULTS: A total of 798 microvascular free flaps were performed. The overall rate of hematoma was 5.8% (n=46). The overall rate of transfusion was 22% (n=179). The risk of postoperative hematoma formation was not affected by prophylactic postoperative antithrombotic therapy with aspirin (81mg or 325mg), preoperative or postoperative anticoagulation (enoxaparin or heparin), the presence of POD0 hypertension, postoperative platelet count, or intra-operative heparin bolus on both univariate and multivariate analyses. On univariate analysis, aspirin (325mg) (1.42 (0.9972-2.013), p=0.049) and subcutaneous heparin (2.462 (1.724-3.511), p<0.001) increased risk of transfusion, while enoxaparin decreased risk of transfusion (0.4174 (0.2743-0.6405), p<0.001). On multivariate analysis, only subcutaneous heparin remained significant for increased risk of transfusion (1.920 (1.133-3.196), p=0.013).

CONCLUSIONS: Our results confirm previous studies showing that neither prophylactic anticoagulation with heparin or enoxaparin nor antiplatelet therapy with either 81mg or 325mg aspirin increases the risk of post-operative hematoma formation even when accounting for other risk factors for hematoma formation. In addition, our results suggest that 325mg aspirin and subcutaneous heparin increase a patient's risk of postoperative transfusion, while enoxaparin appears to decrease a patient's risk. No studies to date specifically compare antithrombotic regimens and transfusion rates in head and neck reconstructive cases, several have reported adverse outcomes in patients receiving transfusions including increased surgical and medical complications and longer length of stay. Our results highlight the potential risk of 325mg aspirin and subcutaneous heparin in the postoperative period. Enoxaparin may be the preferred postoperative anticoagulant in free flap patients compared to subcutaneous heparin but further study is needed.

AHNS36: IMPACT OF IMPLEMENTING STRICTER CRITERIA FOR BLOOD TRANSFUSION IN PATIENTS WITH HEAD AND NECK CANCER UNDERGOING FREE TISSUE TRANSFER

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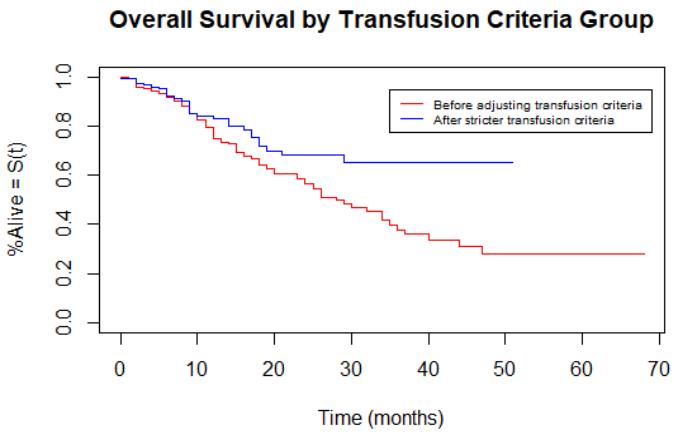
Background: Blood transfusions have long been associated with immunosuppression. The mechanism of transfusion-related immunomodulation remains elusive but is likely due to cell-mediated mechanisms that lead to decreased antigen presentation, T-cell ratios, and natural-killer cell functions. Recent literature studying the impact of blood transfusion on outcomes in patients with head and neck cancer (HNC) have shown that blood transfusions are associated with increased risk of death as well as higher wound infection rates. As such, the increased tendency to transfuse free flap patients in order to maintain a threshold hematocrit has come into question. The purpose of this prospective study was to implement a lower transfusion threshold while comparing outcomes of free flap patients following the initiation of a new transfusion guideline.

Methods: A prospective study of all patients who underwent free tissue transfer after HNC resection between July 17, 2007 and June 7, 2021. Pertinent demographic and clinical data were collected. Our institution began implementing an updated transfusion criteria in 2014, as our Hematocrit threshold to transfuse was incrementally reduced from hematocrit <30 to <21 finally in 2017. A portion of patients in the transition group were excluded as criteria was adjusting. Our control group (group 1) represented patients before 2014, and patients after 2017 were included in the stricter transfusion criteria group (group 2).

The overall survival (OS) and recurrence free survival (RFS) of our two groups were determined using the Kaplan-Meier method and compared statistically using log-rank tests. Chi-square test and student t-test were used for analysis of the variables of each group.

Results: A total of 346 patients met the criteria for inclusion in the study. Group 1 consisted of 171 patients compared with 175 in group 2. The majority of patients had squamous cell carcinoma (84.4%), and the most common tumor site was the oral cavity (67.9%). Group 2 had a statistically significant higher rate of stage III/IV tumors (71.7% vs 60.5% in group 1, p=0.028). Mean length of stay was significantly shorter in group 2 (8.3days vs. 9.9 in group 1, p=0.001). Mean units of blood transfused per patient was significantly less in group 2 (0.26 vs 2.87 in group 1, p<0.001). Patients in group 2 also experienced significantly less postoperative wound breakdown or infections (14.3% vs. 26.3% in group 1, p=0.006). There was a difference between the types of flaps used in both groups, with group 1 having significantly more radial forearm free flaps whereas group 2 had an increased number of ALT flaps (p=0.006). Group 1 was associated with worse OS (p=0.01; hazard ratio [HR]=1.7) and RFS (p<0.001; HR=2.5). Comparing only patients with SCC between the two groups also found poorer OS and RFS in group 1 (p=0.002; HR=2.0) and RFS (p<0.001; HR=2.4). Free flap failure rates were the same in both groups (3.5% group 1 vs. 1.7% group 2; p=0.29).

Conclusion: After implementing a lower transfusion threshold of hematocrit <21 for HNC patients, we demonstrated an improvement in OS, RFS, and wound infection rates without any impact on free flap survival.



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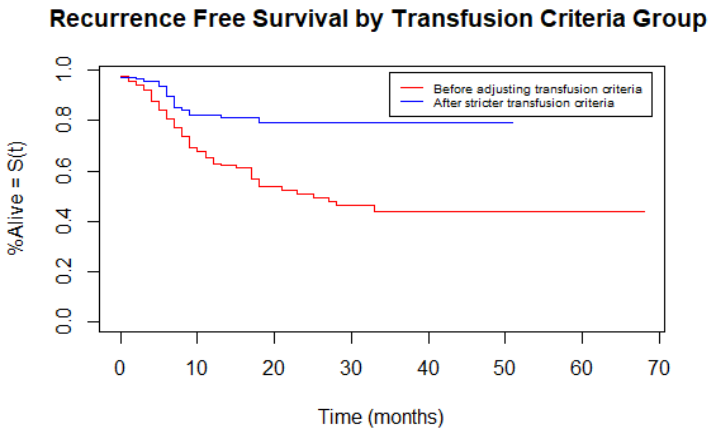

AHNS37: PERIOPERATIVE COMPLICATIONS IN SCAPULA, FIBULA, AND OSTEOCUTANEOUS RADIAL FOREARM FREE FLAPS: A MULTICENTER STUDY

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Importance: Osteocutaneous free flaps have become the optimal method of reconstruction for most major bony head and neck defects. Nationally, the scapula free flap (SFF), fibula free flap (FFF), and osteocutaneous radial forearm free flap (OCRFFF) represent the most commonly utilized osseous flaps. Existing literature on perioperative complications between these three donor sites has been limited by insufficient sample size of SFF or OCRFFF.

Objective: To compare perioperative complications between patients receiving FFF, OCRFFF, and SFF in a large multi-institutional cohort.

Design: Retrospective analysis of patients with major osseous defects undergoing reconstruction with a FFF, OCRFFF, or SFF over a continuous timeframe between 2005-2019

Main Outcome and Measure: Patients were stratified based on the type of free flap performed. Baseline clinical factors were compared between groups using the chi squared test for categorical variables, and ANOVA or nonparametric tests depending on the normality of the distribution. Perioperative complications assessed included overall acute wound complications, acute surgical site infection (SSI), wound dehiscence, fistula, hematoma, flap re-exploration, and flap failure. Clinical factors associated with these outcomes were analyzed using univariable and multivarible logistic regression.

Results: After exclusions, a total of 1022 patients were available for analysis: 510 (49.9%) FFF, 376 (36.8%) OCRFFFF, and 136 (13.3%) SFF. Median operative time (IQR) differed significantly between flap types [OCRFFF: 527 (467-591) min, FFF: 592 (507-714) min, SFF: 691 (610-816) min, p < 0.001]. Rates of overall acute wound complications, SSI, dehiscence, and hematomas did not significantly differ between groups. Compared to OCRFFF, FFF (Odds Ratio [OR]: 2.49, 95% Confidence Interval [CI] 1.36-4.55) and SFF (OR: 3.02, 95% CI: 1.40- 6.54), were independently associated with a higher rate of flap failure. Other independently associated variables with flap loss included acute SSI (OR: 3.19, 95% CI: 1.96-5.19), female gender (OR: 2.01, 95% CI: 1.24- 3.26), and current tobacco use (OR: 1.69, 95% CI: 1.04- 2.74). FFF were associated with a higher rate of fistula (OR: 1.76, 95% CI: 1.07- 2.91) versus OCRFFF. Other independently associated variables with fistula included acute SSI (OR: 8.71, 95% CI: 5.72- 13.26) and multiple bone segments (OR: 2.04, 95% CI: 1.22- 3.41).

Conclusions and Relevance: This multi-institutional study suggests that OCRFF compare favorably with FFF and SFF and were associated with lower rates of free flap failure and fistula.

AHNS38: ELEVATED BMI IS ASSOCIATED WITH INCREASED RATES OF VENOUS THROMBOEMBOLISM IN PATIENTS UNDERGOING HEAD AND NECK FREE FLAP RECONSTRUCTION

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BACKGROUND: Venous Thromboembolism (VTE) is a potentially fatal complication seen in 1.4-5.8% of patients after free tissue transfer to the head and neck (H&N) region. Fixed-dose enoxaparin 30 mg twice daily (BID) is a widely used chemoprophylaxis regimen. However, differences in enoxaparin metabolism based on body weight may influence its efficacy and safety profile. We aim to assess the impact of body-mass-index (BMI) on VTE, hematoma, and vascular compromise rates within 30 days of surgery.

METHODS: A prospective cohort of patients who underwent H&N reconstruction (between 2013-2021) with free tissue transfer and received 30 mg BID enoxaparin post-operatively was reviewed. Demographic data, BMI, comorbidities, smoking status, personal VTE history, family VTE history, Caprini score, and flap type were collected for each patient. BMI was divided into four categories: underweight (<18.5), healthy (18.5 to <25), overweight (25 to <30), and obese (>30). Moreover, The VTE risk in all patients who are deemed to be overweight or obese was assessed. Post-operative adverse events were recorded, including VTE, hematoma requiring intervention, and vascular compromise within 30 days of index surgery. Multivariate logistic regression models were used to evaluate the association between BMI and VTE, hematoma, and vascular compromise, respectively.

RESULTS: 712 (mean age 61 ± 12 years, 33.23% female) out of 917 patients met inclusion criteria. The mean BMI was 26.68 ± 8.20. Venous thromboembolism, hematoma, and vascular compromise rates among all patients were 4.1%, 5.2%, and 6.6%, respectively. VTE rates in patients with BMI < 25 were significantly lower than in patients BMI > 25 (5.8% vs. 2.1%, p= 0.013). The VTE rate was also significantly increased in obese (BMI > 30) patients compared to all other patients (6.7% vs.3.2%, p=0.040). There were no significant differences in hematoma rates in the underweight patients (BMI < 18.5) when compared to all other patients (10.7% vs. 4.7%, p= 0.53). The BMI four categories were not associated with vascular compromise (p = .3889). After adjusting for multiple patient

factors, BMI > 25 was independently associated with increased odds of VTE (OR 2.735 95%CI: 1.143-6.543). Body-mass-index outperformed Caprini score to predict post-operative VTE.

CONCLUSIONS: Elevated BMI is associated with an increased risk of VTE after head and neck reconstruction with free tissue transfer. This association may suggest insufficient VTE prophylaxis in this group and a potential indication for weight-based dosing.

AHNS39: OCCULT NODAL METASTASIS IN SURGICALLY TREATED HPV-RELATED OROPHARYNGEAL SQUAMOUS CELL CARCINOMA

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Objective: (1) To describe the incidence and predictors of radiographic occult nodes in patients with clinically node negative (cN0) HPV-related oropharyngeal squamous cell carcinoma (OPSCC) and treated with primary surgery.

Study Design: Retrospective cohort study.

Methods: Retrospective review of patients presenting to a tertiary care center with cN0 HPV-related OPSCC and treated with primary trans-oral robotic surgery (TORS) from March 2007 to March 2021 was performed. Data included patient demographics, diagnostic imaging, histopathology, and survival outcomes. Analyses using the Kaplan-Meier method, and univariate and multivariate logistic regression were performed to assess for variables predictive of pathologic nodal disease.

Results: Seven hundred seventy-eight patients were included, with 112 presenting as cN0 following diagnostic work-up. The median age at surgery was 63 (IQR: 59-69) and 88 (79%) were male. Regional disease was assessed with a battery of imaging modalities, including CT with contrast in 75 patients (67%), MRI with/without contrast in 31 (27.7%), and PET/CT in 58 (52%), non-exclusively. The incidence of a pathologic positive node on ipsilateral neck dissection was 32%. Four percent of cN0 patients had level 4 or 5 involvement and 8% had extracapsular extension. Sixty-six percent of patients were treated with surgery only, 21% with adjuvant radiation, and 13% with adjuvant chemoradiation. Of the 10 of patients who underwent bilateral neck dissection, no contralateral occult nodes were found. Contralateral neck dissection was indicated in 9/10 patients due to base of tongue primary, and all subsequently did not require adjuvant therapy. Disease-free survival at 3 years was equivalent between cN0 and cN1-3 patients (72.5% vs. 71.4%, p = 0.120). Late tumor stage, lymphovascular invasion, and perineural invasion (OR 2.13, p = 0.022; OR 1.82 p = 0.044; OR 2.86, p = 0.048, respectively) were predictive of pathologic positive nodes in cN0 patients. The use of only one diagnostic imaging modality, or the exclusion of any specific imaging modality, were not found to be associated with a pathologic positive node.

Conclusion: Here we demonstrate that occult regional metastasis to ipsilateral cervical nodes is prevalent in HPV+ OPSCC. Advanced primary tumor characteristics are predictors of occult nodes, while type of diagnostic imaging used was not. Contralateral neck dissection in patients with base of tongue tumors has a low yield for radiographic occult nodes.

AHNS40: DETERMINING THE ROLE OF HPV INTEGRATION IN OROPHARYNGEAL SQUAMOUS CELL CARCINOMA

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Background: The rapid rise of head and neck squamous cell carcinoma is due, in part, to the increased incidence of HPV-mediated oropharyngeal squamous cell carcinoma (OPSCC). This is a viral-mediated disease and as such likely co-exists with the virus in two distinct states: episomal, or outside the host genome, and integrated into the genome itself. Understanding the integration status of the virus in OPSCC could aid in determining future treatment paradigms, but first a rapid, low-cost assay for detecting integration is needed.

Methods: RNA from formalin-fixed, paraffin embedded tissues (FFPE) from 123 known OPSCC tumors was extracted and assayed on an nCounter MAX Analysis System with the Human PanCancer IO 360 with an additional eight HPV genes included in the target codeset following the manufacturer's protocol. As suggested in the protocol, total RNA input was adjusted to 100 ng based on DV300 values from TapeStation 4200 profiles: (100/percent of sample > 300 nt) x 100 ng. A panel standard was run on each cartridge to allow for normalization. HPV E6 and E5 levels were constructed as a ratio to determine integration status. For verification runs, RNAseq was performed on libraries generated from the same samples and human-viral reads were used to identify integrated tumor samples. Sequencing was performed on a NovaSeq 6000 system with a 2x50 bp paired-end configuration following the manufacturer's protocol. The pools were designed to target about 105 million clusters per library on average on either a S2 flow cell (n=40) or a S4 flow cell (n=93).

Results: Use of the E6:E5 expression ratio was highly sensitive and specific (92.6% and 95.1%, respectively) for detection of integrated HPV16 in OPSCC samples. This was confirmed by RNAseq-based human-viral reads and subsequent E6/E7:E2/E5 reads as determined by viral genome RNAseq analysis. Additionally, HPV16 detection by this method was also both highly sensitive (100%) and highly specific (89.1%).

Conclusions: We have developed a method to rapidly determine HPV presence and integration status using RNA signatures in OPSCC tumors. This technology could be used to identify HPV-positive tumors with integration status and could aid in selection of appropriate treatment modalities.

AHNS41: FACILITY TYPE PREDICTS TREATMENT REGIMEN FOR HPV-POSITIVE OROPHARYNGEAL SQUAMOUS CELL CARCINOMA

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Introduction: Over the past two decades, human papillomavirus-positive (HPV+) oropharyngeal cancer (OPC) has been recognized as a distinct entity affecting a younger, healthier patient population with improved oncologic outcomes using the standard radiation (RT) and chemoradiation (CRT) treatment protocols for OPC. Subsequently, there is significant interest in the de-escalation of treatment to limit functional morbidity without compromising oncologic outcomes. With the synchronous arrival of transoral robotic surgery during the past two decades, surgery has provided an alternative upfront treatment for HPV+ OPC that has been shown to have similar oncologic outcomes to RT and CRT with

potentially decreased short- and long-term morbidity. However, adaptation of this treatment modality has been largely restricted to academic medical centers that have the training and resources to offer transoral robotic surgery. This study aims to provide a retrospective analysis of the treatment trends of HPV+ OPC between academic and non-academic centers.

Methods: The National Cancer Database (NCDB) was queried and data pertaining to histologically-confirmed HPV+ OPC between the years of 2010 to 2016 were included. The American Joint Committee on Cancer (AJCC) 7th Edition staging guidelines were utilized. Multinomial logistic regression stratified by clinical stage was used to predict the odds that patients treated at academic facilities would receive RT or CRT versus surgery, while controlling for demographic factors. Statistical analysis was performed using SPSS version 27.0 with $p<0.050$ selected for significance threshold.

Results: 30,243 patients with HPV+ OPC were included, with 15,155 (50.1%) treated at non-academic facilities and 15,088 (49.9%) were treated at academic facilities. For patients with early stage HPV+ OPC, a total of 2,064 (66.7%) received surgery upfront, 589 (19.0%) underwent RT alone, and 443 (14.3%) received CRT. 16,273 (59.9%) patients with advanced stage cancer were treated with CRT, whereas 8,960 (33.0%) received surgery and 1,914 (7.1%) received RT alone. A significantly higher proportion of all patients, regardless of stage, were treated with surgery when comparing between academic versus non-academic facilities ($p<0.001$). Facility type predicted first course treatment for both early stage and advanced stage patients on multinomial logistic regression controlling for age, CD index, and clinical stage ($p<0.001$ in all cases). Patients treated at academic centers were less likely to receive RT compared to surgery (OR 0.57, 95% CI of 0.47-0.69 for early stage patients; OR 0.80, 95% CI of 0.73-0.89 for advanced stage) and less likely to receive CRT compared to surgery (OR 0.62, 95% CI of 0.50-0.77 for early-stage; OR 0.76, 95% CI of 0.72-0.80 for advanced stage).

Conclusion: Facility type determines treatment course for HPV+ OPC, both for early stage as well as late stage tumors. Academic hospitals are more likely to utilize surgery as primary treatment modality and patients are less likely to receive RT or CRT alone at these facilities. Although there are several factors that differentiate treatment options between academic and non-academic facilities, the highlighted differences in treatment approach point to a lack of standardized treatment regimens which prevent patients from receiving universal care independent of facility resources.

AHNS42: PREDICTING EXTRANODAL EXTENSION IN EARLY-STAGE HUMAN PAPILLOMA VIRUS-DRIVEN OROPHARYNGEAL CANCER: MACHINE LEARNING USING PET CT AND CLINICAL PARAMETERS.

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Background: Early-stage human papilloma virus (HPV)-driven oropharyngeal cancer has excellent survival outcomes. The current therapeutic strategies aim to reduce treatment-related morbidity: transoral robotic surgery (TORS) +/- adjuvant (chemo) radiotherapy, or upfront (chemo)radiotherapy +/- salvage surgery. Greatest morbidity is associated with tri-modality therapy, and identification of patients destined to tri-modality therapy is critical to negate unnecessary morbidity. Extranodal extension (ENE) remains a primary indication for adjuvant chemoradiotherapy. Therefore, pre-treatment identification of occult ENE would allow patients to be directed towards optimal primary oncological management.

Objective: To identify CT, PET CT, and clinical parameters that predict ENE in early-stage HPV-driven oropharyngeal cancer.

Methods: Retrospective collation of clinical, radiological and pathological data was conducted on all patients with early-stage HPV-driven oropharyngeal cancer (cT1-3N0-2), without clinical or radiological evidence of ENE, undergoing TORS between January 2016 and September 2021. Pre-operative PET CTs were re-evaluated to establish standard uptake value (SUVmax), metabolic tumour volume, total lesion glycolysis, and uptake patterns in primary and nodal disease. Risk of ENE was evaluated with respect to clinical and PET CT parameters.

Results: Of the 75 patients fitting inclusion criteria, pathological nodal disease was identified in 59 patients and ENE was identified in 16 individuals. Mean age was 61 years, with a male predominance (M:F ratio = 4.77:1). Univariate analysis of all factors highlighted that indistinct nodal margins on CT imaging was associated with ENE (OR=12.3, CI 95% = 1.25-121.3, $p=0.0312$). Multivariate analysis performed on all factors identified increasing age ($p=0.046$), combined tongue base and tonsil tumours ($p=0.023$), indistinct nodal margins ($p=0.022$) and higher nodal SUVmax ($p=0.030$) were all associated with increased risk of ENE. A high volume of variance was accounted for by the multivariate analysis model, with an AUC of 0.89.

Conclusions: This study indicates that clinical and PET CT parameters are able to predict the presence of ENE, having implications for optimising patient outcomes. A nomogram of significant factors has been compiled in Figure 1.

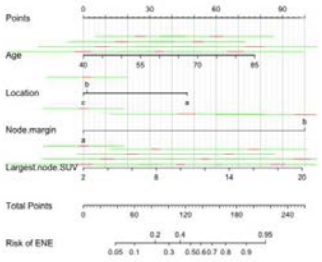

Figure 1:

Nomogram for risk of extranodal extension. Each predictor can be mapped to the superior points axis. The sum of these points can be referred to the total points axis to allow a risk of ENE prediction to be made. Green bars indicate 0.7 confidence limits for each score and red bars indicate 0.1 confidence limits. Categorical variables are classified as follows:

- Location:
  - a) Both tonsil and tongue base involvement
  - b) Tonsil
  - c) Tongue base
- Node margin indistinct
  - a) No
  - b) Yes

AHNS43: EVOLVING BEYOND THE "UNKNOWN PRIMARY": TRANSORAL SURGERY FACILITATES ROUTINE IDENTIFICATION OF A T1-MICROSCOPIC P16+ OROPHARYNGEAL SCC

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Importance: Squamous cell carcinoma metastatic to the neck arising from an unknown primary tumor (hnSCCUP) is a common

presentation for human papillomavirus-mediated oropharyngeal squamous cell carcinoma. Prior to transoral endoscopic H&N surgery (eHNS; either TLM and TORS), rates of identification for hnSCCUP were dismal. Now, with transoral endoscopic surgery, small microscopic T1 p16+ SCC are routinely found. Their manifestation clinically appeared to evade detection with any kind of imaging and traditional endoscopy and may represent a "new" clinical entity: T1-micro-p16+ oropharyngeal carcinoma (OPC).

Objectives: First, to describe the clinical features and oncologic outcomes of patients with T1-micro-p16+ oropharyngeal carcinoma (OPC).

Design: Retrospective chart review from 2013-2021.

Setting: Academic medical center.

Participants: All patients diagnosed with hnSCCUP who underwent diagnostic TORS to identify the primary site were included. Patients were excluded if they had prior history of head and neck cancer or had obvious lesion detected during operative direct laryngoscopy, PET-CT, or MRI.

Main Outcomes and Measures: Identification rate of the occult primary tumor; clinical and pathologic features of T1-micro-OPC

Results: Seventy-five patients with hnSCCUP met inclusion criteria of which 72 (96%) were had p16+ IHC staining; three patients had equivocal IHC but were found to have HPV DNA on in-situ hybridization. The primary site was identified in 67 (89.3%) diagnostic TORS operations with a mean (SD) primary tumor size of 8 mm. Most patients (60%) had classic presentation confined to a single subsite, but 40% of these patients had multifocal, low-volume submucosal disease tracking across multiple subsite. Two patients had disease spanning the entire disease oropharynx from tonsillar tissue, demonstrating histologically a remarkable disease pattern – heretofore not appreciated. Definitive treatment included surgery alone for 7 patients, surgery with adjuvant therapy in 14 patients, and radiotherapy with or without chemotherapy in 54 patients. At last follow-up, 74 patients were alive with no locoregional tumor recurrence and a single patient who died from distant metastatic disease.

Conclusions and Relevance: Transoral eHNS is a useful intraoperative adjunct to facilitate identification of the primary site in patients with SCCUP. Moreover, surgical staging has revealed a unique pattern of submucosal disease, with an average size of 8mm, that is multifocal in nearly 40% of hnSCCUP. These findings suggest that surgery has mostly eliminated the concept of the unknown primary revealing instead a T1-microscopic p16+ OPC.

AHNS44: THE COST IMPLICATIONS OF A PROPOSED MODIFIED SURVEILLANCE STRATEGY TO DETECT DISEASE RECURRENCE IN HPV+ OROPHARYNGEAL CARCINOMA UTILIZING PLASMA CIRCULATING TUMOR HPV DNA: A SINGLE INSTITUTION'S EXPERIENCE.

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Background: Patients with HPV related oropharyngeal carcinoma tend to have more favorable outcomes after treatment than their HPV negative counterparts. However, a substantial percentage of patients will develop recurrence in the post treatment setting. Furthermore, it has been recognized that patterns of recurrence among HPV related cases can differ greatly between patients and can be unpredictable, especially when occurring at distant sites. Currently, there are no standard guidelines for surveillance, which frequently leads to repeat costly imaging and frequent office visits with procedures. The development of a novel blood test in the form of a tumor specific HPV DNA assay may have the potential to revolutionize the detection of recurrence within HPV related cases, with early studies demonstrating a 100% negative predictive value and 94% positive predictive value. We set out to propose a modified surveillance strategy using this test as the main method of detection to understand the cost implications of potentially avoiding routine imaging and surveillance visits at our institution.

Methods: We performed a retrospective chart review of 214 p16+ patients with OPSCC, 23 of which had recurrence confirmed with biopsy during a 5-year observation period. Based on our retrospective review, we defined two surveillance strategies, the "current" and "proposed" method which utilizes HPV DNA assay. The current strategy was based on our institution's consensus surveillance paradigm which includes follow up visits quarterly for 2 years then semiannually for 3 years with a total of 14 visits (endoscopy at every visit) plus annual neck and chest CT with one post-treatment PET/CT. The "proposed" strategy modification compromises of semiannual follow up visits with flexible laryngoscopy for 5 years and HPV DNA assay testing at every visit plus additional assays during pre-treatment and 4 weeks during treatment with imaging to be used at the discretion of the physician(s) in cases of high clinical suspicion. We used select patient cases to perform a flow through, comparative cost analysis to get an estimate of potential cost savings on an per case basis.

Results: Of the p16+ OPSCC patients (n=214), 23 had recurrence of disease (10.75%), mostly within the first 2 years post-treatment (18/23 = 78.26%), and 11 had locoregional recurrence (11/23 = 47.83%). Median follow up time was 44 months post-treatment. The standard work flow model determined that 72 imaging studies and 2198 physical examinations with flexible laryngoscopy were needed to detect one recurrence in our cohort. Based on our cost analysis, we determined a potential individual patient cost reduction of 42% in the post-treatment, surveillance period.

Conclusions: The promising performance of plasma circulating tumor HPV DNA to detect recurrence in HPV+ OPSCC is capable of substantial cost savings in the post treatment surveillance period. Our institutional analysis led us to understand the number of imaging studies required to detect a single recurrence and the associated cost savings by implementing a proposed surveillance strategy with HPV DNA assay test in favor of frequent office visits, endoscopic procedures, and routine imaging.

AHNS45: VIRTUAL SURGICAL PLANNING FOR MAXILLARY RECONSTRUCTION WITH THE SCAPULAR FREE FLAP: AN EVALUATION OF A SIMPLE CUTTING GUIDE DESIGN

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Background: Maxillary reconstruction is challenging due to the complex anatomy of the maxilla. Virtual surgical planning (VSP) allows surgeons to pre-plan the reconstruction and generate 3D-printed cutting guides and models for intraoperative use. In the literature, VSP for maxillary reconstruction typically utilize

commercial services which can be cost prohibitive, and in house solutions are challenging due to the complexity involved in cutting guide design. The authors have developed an in-house VSP platform for planning of mandibular and maxillary reconstruction surgeries. The goal of this study is to assess maxillary reconstruction with the scapular free flap utilizing this in-house VSP with a simple cutting guide design compared to a historical control cohort undergoing freehand surgery without preplanning.

Methods: Ten maxillary reconstruction cases were planned with VSP using an in-house software. Models of the reconstruction and scapular resection were 3D printed and used intraoperatively for visualization and estimation of the size and position of the flap (Figure 1). Clinical outcomes, functional outcomes as measured by the Disabilities of the Arm, Shoulder and Hand and the Oral Health Impact Profile-14 questionnaires, cephalometric measurements, and dental implantability of the VSP cohort were compared to 18 consecutive historical control cases not utilizing VSP.

Results: Patients in the VSP cohort were more likely to undergo surgeries with a two-team approach (80% vs 0%, p<0.01) and had a significantly lower tracheotomy rate (20% vs 72%, p<0.01). VSP resulted in significantly lower operating time (256 ± 69 minutes vs. 448 ± 108 minutes, p<0.01) and lower average deviation between the reconstruction and pre-operative maxillary cephalometrics, measured as a combination of variables including malar height, maxilla height, maxilla width, premaxilla height, and anterior-posterior projection (7.5±3.4 mm vs 11.7±7.6 mm, p=0.048). There was no significant difference in length of hospital stay, complication rates, dental implantability rates, or functional outcomes.

Conclusions: In house VSP with a simple cutting guide design has allowed for a two-team simultaneous oncologic resection and reconstruction harvest with improved ability to reconstruct maxillary cephalometrics. This is associated with decreased operating time, lower tracheotomy rate and potential for cost-reduction. The VSP method introduced in this study is open-source, inexpensive and can be reproduced at other centres.

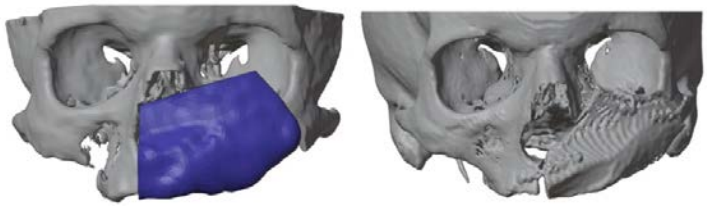

Figure 1: Preoperative plan of a maxillary reconstruction case utilizing VSP (left) and corresponding postoperative model (right).

AHNS46: PATTERN OF LYMPH NODE METASTASIS OF CUTANEOUS MALIGNANCIES INVOLVING THE TEMPORAL BONE

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Objective: The objective of the present study was to explore the pattern of lymph node spread malignancies involving the lateral temporal bone, as well as determine the rate of spread to the parotid gland.

Methods: We retrospectively reviewed all lateral temporal bone resections for malignancies involving the lateral temporal bone over a 20-year time period. 39 patients were available for final analysis. Type of neck dissection performed and adjunctive procedures such as parotidectomy and pinnectomy performed were recorded.

Results: Mean age was 70.68 ± 12 years. The most common histological diagnosis was SCC in 84.2% (n=32).

All patients underwent a LTBR, while 68.4% (n=26) underwent a pinnectomy, 71.1% (n=27) had a parotidectomy and 65.8% (n=25) had a neck dissection (44% of which were modified radical).

Level 1 was positive in 2.6%, level 2 in 15.8%, level 3 in 7.9%, level 4 in 7.9% and level 5 in 5.3%. The parotid had disease in 34.2% (n=13), of which 54% was due to direct invasion. 59% of patients underwent free flap reconstruction. Pathological size of the main specimen did not influence the rate of nodal disease, however depth of the specimen did (p=0.117 and 0.009 respectively).

Mean overall survival of the cohort was 4 years, while mean disease specific survival was 5.3 years. There was no statistical significant difference in survival based on nodal disease or parotid disease.

Conclusions: In the present study the rate of cervical nodal metastasis was 21%, with the most common location for nodal metastasis in level 2. The parotid was involved in in 34% of cases. Due to the high rate of parotid disease, results from the present support consideration for performing a parotidectomy at the time of lateral temporal bone resection, while a neck dissection can be performed for adequate staging of the nodal basin as well as during dissection of vessels for microvascular reconstruction.

AHNS47: THE EFFECTS OF PSYCHOSOCIAL DETERMINANTS ON POSTOPERATIVE COMPLICATIONS OF HEAD AND NECK FREE FLAP PATIENTS

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Importance: Not much is known about how pre-operative psychosocial factors affect head and neck free flap outcomes.

Objective: To determine if a patient's pre-operative self-perception and quality of life affect postoperative complications and hospital length of stay after free flap surgery

Design, Setting, and Participants: This was a prospective cohort study. Patients who underwent free flap surgery at an academic tertiary care center between January to September 2021 were asked to fill out the Rosenberg Self Esteem Scale and the Short Form 36 before surgery. A chart review of their medical records was then performed. Analysis of the data was performed using the Fisher exact test and Mann-Whitney on STATA 15.

Exposures: Free Flap

Main Outcomes and Measures: Rosenberg Self Esteem Scale score, Short Form 36 subset scores, demographic characteristics, postoperative complications, length of stay

Results: Thirty patients (21 male, 9 female, mean [SD; range] age: 59.5 [14.5; 23.1 - 84.9]) who underwent free flap surgery agreed to participate in the study. Sixteen patients (53.5%) were Caucasian and fourteen patients (46.7%) had preferred provider organization

(PPO). Insurance status did not affect postoperative complications. The most common indication for surgery was malignancy (93.3%). Nine patients (30%) had one or multiple post-operative complications. Postoperative complications included 2 hematoma (6.7%), 2 free flap failure (6.7%), 1 wound dehiscence (3.3%), 4 salivary fistulas (13.3%), and 2 aspiration pneumonia (6.7%). There were no mortalities. The mean physical functioning subscore [SD; range] and social functioning subscore of the SF-36 were 86 [20.6, 10-100] and 76 [25.1, 12.5-100]. The mean Rosenberg Self Esteem Scale score was 24.4 [4.6, 13 – 30]. Improved physical functioning score and social functioning score were associated with fewer overall post-operative complications (p = 0.029 and 0.030, respectively), but were not correlated with length of stay. Mean self-esteem score was not associated with postoperative complication rates.

Conclusions and Relevance: In this study, patients who perceived that they could do more physically and had fewer social limitations had fewer postoperative complications. It is important to continue to explore how preoperative quality of life and other psychosocial factors can affect surgical outcomes as they can affect the patients' postoperative course.

AHNS49: CUTANEOUS HEAD & NECK MALIGNANCIES WITH LOW AND HIGH-RISK PERINEURAL INVASION: PATTERNS OF TREATMENT FAILURE & ONCOLOGIC OUTCOMES

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Background: Cutaneous cancers of the head and neck with perineural invasion (PNI) are associated with neurologic dysfunction, local recurrence, and inferior survival. Resection followed by radiotherapy (RT) or RT alone for unresectable disease remain the mainstays of treatment. PNI is classified as clinical/gross (cgPNI) or microscopic (mPNI) based on clinical, radiographic, and histopathologic analysis. cgPNI includes clinical or radiographic involvement of cranial nerves. mPNI is evident on histologic examination alone with subsets of extensive invasion of nerves (ePNI) or invasion of large nerves (diameter ≥ 0.1 mm) (lnPNI), suggesting higher risk pathologic findings. There is no consensus to what extent nerve pathways should be treated with radiation with varying risk of PNI. The aims of this study were to examine oncologic outcomes and patterns of treatment failure in cutaneous malignancies of the head and neck with low and high-risk PNI.

Materials & Methods: A retrospective review of patients (2010-2021) who completed definitive or adjuvant RT for squamous cell carcinoma (SCC) or basal cell carcinoma (BCC) of the head and neck with PNI was performed. Patient demographics, RT treatment, clinicopathologic data, oncologic outcomes, and patterns of failure were recorded. Patients with cgPNI, ePNI, or lnPNI were classified as high-risk PNI. Fischer's exact tests and unpaired t-tests were used to examine relationships of age, sex, and margin status between the high and low risk groups. Log-rank tests were used to compare disease-free, disease-specific, and overall survival.

Results: A total of 51 patients were included, 45 (88%) with SCC and 6 (12%) with BCC. 29 patients had high-risk PNI: 18 (35%) cgPNI, 6 (12%) lnPNI, and 5 (10%) ePNI. 22 patients (43%) had mPNI (low-risk). Surgical resection was performed in 20 (69%) high-risk PNI and 21 (95%) low-risk patients. All 18 (100%) patients with cgPNI, 1 (20%) with ePNI, and 3 (50%) with lnPNI underwent RT to the skull base and neural pathway(s). The mean follow-up time was 23 months. Nineteen (66%) high-risk PNI and 5 (23%) low risk patients presented with recurrent disease following previous treatment. In-field recurrences occurred in 5 (23%) patients with cgPNI, three of which had undergone prior treatment. Three mPNI patients (14%) who underwent RT to the wound bed experienced an in-field recurrence. When comparing the high-risk vs. low-risk groups, there were no statistically significant differences in disease-free survival (p=0.60, 2-year: 57% vs. 71%), disease-specific survival (p=0.73, 2-year: 86% vs. 85%), or overall survival (p=0.98, 2-year: 75% vs. 85%).

Conclusions: In this single-institution cohort, neither recurrence nor survival outcomes significantly differed between patients with high-risk and mPNI. This suggests local control rates in high-risk PNI are on par with low-risk/mPNI following a comprehensive multi-modality approach. Furthermore, in field failures were rare and occurred largely in patients who underwent prior treatment.

AHNS50: INCREASED HEALTHCARE UTILIZATION AMONGST PATIENTS RECEIVING IMMUNOTHERAPY IN THE LAST THREE MONTHS OF LIFE - A SEER-MEDICARE ANALYSIS

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Importance: The impact of patients receiving immunotherapy within the last three months of life on healthcare utilization has yet to be determined.

Objective: To evaluate whether receiving immunotherapy within the last three months of life predicts higher healthcare utilization in the form of hospital admissions, intensive-care unit (ICU) admissions, emergency department (ED) visits, and hospice claims.

Design, setting, and participants: Analysis of 14,150 patients ≥ 65 years old from the SEER-Medicare database who were diagnosed with head and neck cancer between 2007 and 2017 and died between 2007 and 2018. Patients were enrolled in both Part A and Part B for at least one month prior to diagnosis and were excluded from analysis for lapses in coverage or use of managed care.

Main Outcome(s) and Measure(s): Data were collected from the SEER-Medicare registry on patient demographics and tumor characteristics. Carrier claims files were used to determine whether patients received cetuximab, nivolumab, or pembrolizumab within the last three months of life. The primary outcomes of interest were hospital admissions, ICU admissions, ED visits, and hospice claims within the last three months of life. Associations between patient demographics, healthcare utilization and whether a patient received immunotherapy in the last three months of life was completed using Student's t-testing and $\chi 2$ testing. All analysis was performed using SAS v9.4 (SAS Institute Inc., Cary, NC, USA).

Results: Among 14,150 patients with head and neck cancer meeting inclusion and exclusion criteria, 312 received immunotherapy within the last three months of life. Among those who did and did not receive immunotherapy, there were significant differences in age (p=0.0025), race (p=0.0078), site (p= 0.0102), stage (p<0.0001), histology (p=0.0011) and hospice

length of stay (p<0.0001). There were no significant differences in grade, sex, or having any hospice claim during the final three months of life (Table 1). Within the last three months of life, healthcare utilization was significantly impacted by a patient receiving immunotherapy. Patients who received immunotherapy had significantly higher ED visits (2.7 ± 4.1 to 2.0 ± 42, p=0.0069) and significantly lower hospice claims (0.79 ± 1.0 to 1.0 ± 1.6, p<0.0001). There was no significant difference in hospital or ICU admissions. (Table 2).

Conclusion: Within the final three months of life, there was significantly higher ED visits among those who received immunotherapy and significantly lower hospice utilization. Further study of end-of-life healthcare utilization can offer insight into opportunities to improve end-of-life care amongst head and neck cancer patients nationally.

Table 1: Patient Demographics and Tumor Risk Factors

Variables	Immunotherapy N= 312	No Immunotherapy N= 13,838	P-value
Age at Diagnosis	75.7 ± 6.8	76.9 ± 7.9	**0.0025**
Sex			0.3346
Female	102 (32.7)	9,665 (69.8)	
Male	210 (67.3)	4,173 (30.2)	
Race			**0.0333**
White	284 (91.6)	12,103 (87.6)	
Non-white	26 (8.4)	1,714 (12.4)	
Site			**0.0102**
Oral Cavity	116 (37.2)	4,790 (34.6)	
Oropharynx	29 (9.3)	912 (6.6)	
Nasopharynx	20 (6.4)	673 (4.9)	
Hypopharynx	26 (8.3)	841 (6.1)	
Larynx	121 (38.8)	6,622 (47.9)	
SEER Summary Stage			**<0.0001**
In situ or Localized	87 (29.4)	6,593 (51.8)	
Regional by direct extension or nodes	130 (43.4)	3,566 (28.0)	
Distant sites/nodes involved	79 (26.7)	2,560 (20.1)	
Histology			**0.0011**
Squamous Cell Carcinoma	298 (95.5)	12,442 (89.9)	
Other	14 (4.5)	1,396 (10.1)	
Grade			0.9778
I or II	169 (71.6)	6,978 (71.5)	
III or IV	67 (28.4)	2,778 (28.5)	
Any Hospice Claim	152 (48.7)	6,413 (46.3)	0.4056
Hospice LOS	9.4 ± 8.5	12.3 ± 10.1	**<0.0001**

23 missing values for race
1,139 missing values for SEER Summary Stage
4,158 missing values for grade

Table 2: Care Utilization in the last three month of life

Variables	Immunotherapy N= 312	No Immunotherapy N=14,070	P-value
Hospice Claims	0.79 ± 1.0	1.0 ± 1.6	**<0.0001**
Hospitalizations	1.8 ± 2.3	1.7 ± 2.2	0.3633
ICU Admissions	0.46 ± 0.9	0.47 ± 0.9	0.9414
ED Visits	2.7 ± 4.1	2.0 ± 4.2	**0.0069**

Univariate analysis with T-tests

POSTER LISTINGS

A001: DYSREGULATED EXPRESSION OF HPV RELATED LNCRNA PTENP1 BY SMOKING INDUCES CANCER DRUG RESISTANCE AND RECURRENCE THROUGH C-MYC ACTIVATION

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Chemoresistance and cancer recurrence are a major obstacle in therapeutic treatment. Our previous studies have showed that smoking results in poor survival in HPV positive head and neck cancer, but the mechanism remains unclear. In this study we demonstrated that compared with primary tumors and parental cancer cells, there was significantly downregulated expression of a long noncoding RNA (PTENP1) in recurrent HPV positive head neck tumor and smoking induced cancer cells which results in c-MYC activation and drug resistance. Moreover, there are significantly increased expression of HPV16 E2, E6, E7 oncogenes in all paired recurrent tumors. The increasing expression of HPV16 E5, E6 or E7 oncogenes suppress the expression of PTENP1 in head and neck squamous cell carcinomas (HNSCC). Depletion of c-MYC also decreased the expression of the HPV16 oncogenes E7 in HPV positive HNSCC cells. We further found that smoking inhibits the expression of PTENP1 by deactivation of PKC family. Phorbol 12-myristate 13-acetate (PMA), a PKC activator re-sensitized smoking induced cancer cells to cisplatin via PTENP1/c-MYC pathway. This is the first study demonstrating a prognostic value of lncRNA PTENP1in tumor drug resistance and recurrence. This novel mechanism for smoking induced drug resistance via PTENP1-MYC axis may have important implication in the development of PKC activator for overcoming smoking induced drug chemoresistance and recurrence.

A002: IN VITRO AND IN VIVO EFFICACY OF ANTIBODY-DRUG CONJUGATE TARGETING HER2 IN HEAD AND NECK SQUAMOUS CELL CARCINOMA

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INTRODUCTION: HER2 expression is a predictor of poor survival in patients with head and neck squamous cell carcinoma (HNSCC) and is associated with resistance to cetuximab therapy. There is a wide range of HER2 expression reported in head and neck cancer – higher prevalence in salivary cancers and lower prevalence in squamous cell carcinoma. Because the anti-HER2 antibody, trastuzumab, is effective only when cells are dependent on HER2 signaling for survival, it has largely failed in clinical trials for HNSCC. However, the recent success of antibody drug conjugates (ADCs; antibody linked to a cytotoxic payload) in HER2-positive breast and gastric cancer suggests that other solid tumors may benefit from this approach, even in tumors with low HER2 expression. We assessed the *in vitro* and *in vivo* efficacy of T-DM1, a bioconjugate of a microtubule inhibitor, emtansine, linked to an anti-HER2 antibody, trastuzumab, in HNSCC.

MATERIALS AND METHODS: HER2 expression was evaluated in HNSCC cell lines using western blotting, and relative expression was measured based on HER2 expression levels in the positive control cell line, BT-474. *In vitro* cytotoxicity of T-DM1 in HNSCC was measured using the MTS assay, and IC50 was calculated. A flank tumor xenograft model with UM-SCC-47 (low HER2 expression; 3.6%) in nu/nu mice was used to evaluate *in vivo* efficacy of T-DM1. Tumor-bearing mice were treated with four weekly 15mg/kg intraperitoneal doses of T-DM1, trastuzumab, and saline. The fourth dose was administered using fluorescently conjugated drugs to assess drug distribution using near-infrared imaging. Tumor volume (length * width^2 * 0.5) was measured throughout the treatment period. Missing tumor volume data due to early sacrifice of mice with tumor volume greater than 750mm^3 was imputed using generalized additive models. Tumor volume over time among the treatment groups were compared using linear mixed-effects models.

RESULTS: HER2 expression in HNSCC cell lines was between 1.5% - 10.9% relative to positive control and correlated with *in vitro* cytotoxicity after T-DM1 treatment with two- to four-fold sensitivity compared to negative control. After four weekly doses of the three treatments in an *in vivo* mouse xenograft model, there was statistically significant difference in the tumor volume curves among the treatment groups, where tumors treated with T-DM1 showed slower rate of tumor volume increase compared to that of trastuzumab and saline (Figure 1; p = 0.01). *In vivo* near-infrared imaging of mice after the fourth dose of the fluorescently conjugated drugs showed high fluorescence intensity in the tumor (signal to background ratio: 2.7 $\pm$ 0.3, 3.2 $\pm$ 0.5, T-DM1 and trastuzumab, respectively).

CONCLUSION: Although HER2 expression is low in HNSCC cell lines complicating previous trials of HER2-targeted drugs in HNSCC, *in vitro* and *in vivo* studies show potential for targeting HER2 in patients with HNSCC using ADCs, a novel class of therapeutics.

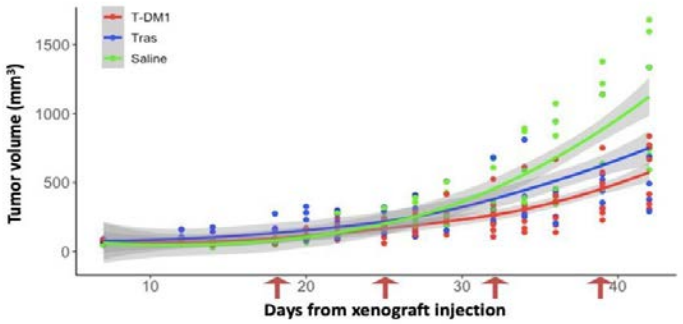

Figure 1. Tumor volume after 4 injections (red arrows) of T-DM1, trastuzumab, and saline in a HNSCC xenograft mice model (UM SCC 47).

A004: CHARACTERIZATION OF HUMAN PAPILLOMAVIRUS IN SINONASAL SQUAMOUS CELL CARCINOMA

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Introduction: Human papillomavirus (HPV) has been shown to contribute to a growing proportion of not only oropharyngeal squamous cell carcinoma (OPSCC), but also sinonasal squamous cell carcinoma (SNSCC), which constitutes a rare but highly morbid cancer. Previous work has shown that different HPV lineages, sub-lineages, and individual genetic variants are associated with notable differences in carcinogenicity and clinical outcomes in HPV-driven cervical cancer as well as HPV+ OPSCC. However, for HPV+ SNSCC, the genomic landscape and molecular impact of

HPV remains to be explored. Here, we undertake the first analysis of paired HPV and somatic whole-genome sequences from a cohort of patients with SNSCC. We aim to define viral genotype, lineage, and sub-lineage distribution as well as mutational processes at play in viral and somatic genomes.

Methods: We performed a universal HPV-type screening on 43 formalin-fixed paraffin-embedded tissue samples from SNSCC cases. We performed whole-genome sequencing of viral, somatic, and paired normal blood DNA for cases containing high-risk HPV types (36 cases). In cases with multiple high-risk HPV types present, all types underwent sequencing using a universal sequencing protocol. We aligned each HPV sample to a reference strain of the corresponding genotype.

Results: Among 43 cases of SNSCC which were screened for HPV, 4 cases were negative for HPV, and 3 cases contained only low-risk HPV (HPV11). The 36 remaining cases were found to contain at least one high-risk HPV type: 26 cases contained a single high-risk genotype, 9 cases contained 2 high-risk genotypes, and 1 case contained 3 high-risk genotypes. Among cases exhibiting high-risk genotypes, 5 cases also contained a low-risk genotype (HPV11 or 84). HPV16 and HPV18 were the most prevalent high-risk genotypes detected, accounting for 39.1% (N=18) and 26.1% (N=12) of genotypes, respectively. HPV33, HPV35, and HPV59 were each present at a rate of 6.5% (N=3 for each). HPV45 and HPV56 were each detected at a rate of 4.3% (N=2 for each), and HPV39 was detected at a rate of 2.1% (N=1). For cases containing more than one high-risk genotype, either HPV16 or HPV18 was present in all but one case, which contained HPV33 and HPV59. We are continuing to explore HPV lineage and sub-lineage distribution, as well as presence of mutations in the viral and somatic genomes.

Conclusion: Using samples from 36 cases of HPV+ SNSCC, we demonstrate here that distribution of HPV genotypes in HPV+ SNSCC is varied, exhibiting a plurality of HPV16, but also large numbers of HPV18, and in smaller amounts several other high-risk HPV types. Interestingly, while etiologic hypotheses have proposed an anatomic link between HPV+ OPSCC and HPV+ SNSCC, the pattern seen here differs from the distribution typically observed in HPV+ OPSCC. This study will contribute to a better understanding of the genomic landscape of HPV+ SNSCC, which may ultimately influence personalized treatment decision making for patients with HPV+ SNSCC.

A005: THE TUMOR IMMUNE LANDSCAPE OF HEAD AND NECK SQUAMOUS CELL CARCINOMA

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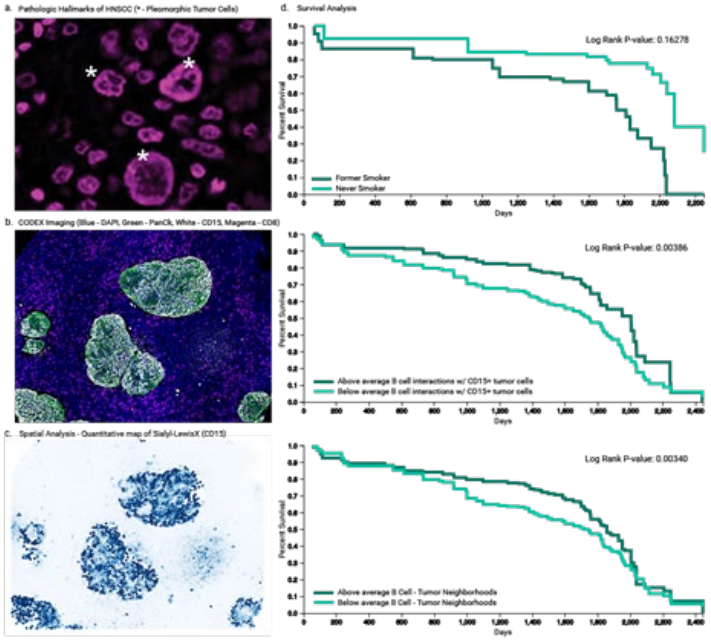
Head and neck squamous cell carcinoma (HNSCC) is a disease known to have poor outcomes with a mortality rate as high as 300,000 deaths per year. Despite advances in therapy, many patients fail to respond or experience subsequent recurrence. Better understanding of the cellular and molecular landscapes of the disease and their association with clinical phenotypes such as HPV status, smoking history, metastases, and survival could improve patient stratification and treatments.

In this retrospective study, we applied highly multiplexed CODEX immunofluorescence imaging to a well-characterized clinical cohort of 86 HNSCC patients. A total of 308 core biopsy specimens from HNSCC laryngeal and pharyngeal primary sites, with a subset of paired specimens from nodal metastases in patients with recurrent disease, were collected to generate tissue microarrays. An antibody panel targeting 36 biomarkers was developed to characterize key cellular, structural and functional proteins involved in HNSCC. CODEX imaging captured hallmarks of HNSCC such as large pleomorphic tumor cells (fig1a), keratin pearls, and stratified squamous epithelium and revealed diverse tumor immune landscapes (fig1b) across clinical phenotypes. Images were quantified utilizing a novel image analysis pipeline including quality control filters which excluded cells from downstream analysis on the basis of automatically detected artifacts (e.g. doublets, fig1c) to generate a final dataset of over 2 million single cells. Unsupervised clustering enumerated 15 distinct cell clusters including 5 tumor subclusters, 8 immune subclusters (e.g. CD4+ T cells, CD8+ T cells, CD20+ B cells, macrophages, fibroblasts), and 2 tissue subclusters (e.g. blood vessels). Biologic and spatial features including protein expression and cellular frequencies, interactions and neighborhoods were computed and exploratory analyses were performed to assess their association with clinical phenotypes such as primary tumor site, smoking/alcohol consumption, HPV status, TNM stage, and survival. This dataset recapitulated many known associations in HNSCC such as the link between HPV status, immune infiltration, and survival. Importantly, novel associations were also identified between the tumor subtypes identified during unsupervised computational analysis and their clinical outcomes. Tumor subtypes were stratified on the basis of expression of Sialyl-LewisX (CD15), Ki67, and podoplanin. While CD15 and podoplanin are known to play a role in a number of tumor types, little work has been done regarding their characterization in HNSCC. Interestingly, we observed that patients enriched for podoplanin+ tumor cell clusters had significantly worse prognosis than those enriched for CD15+ tumor cell clusters. In patients with improved overall survival at 5 years, immune cell interactions were enriched with CD15+ tumor subclusters and not podoplanin+ tumor subclusters, suggesting potential differences in immune exclusion and suppression between these subtypes. To further investigate this hypothesis, we examined tumor immune neighborhoods and identified a tumor cellular neighborhood enriched in B cells that was strongly associated with overall survival [fig1d, Kaplan-Meier, log rank p-value 0.00340]. We believe this work shows a novel infrastructure and analytic pipeline for refined biological subtyping of HNSCC that could inform development of future adjuvant immunotherapies, identify prognostic biomarkers, and ultimately guide treatment decisions based on patients' specific disease profiles.

POSTER LISTINGS



A006: CISPLATIN RESISTANCE IN HEAD AND NECK CANCER: IMPACT OF SECONDHAND SMOKE EXPOSURE

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PURPOSE: One in four Americans, 40.6% of whom are children, are involuntarily exposed to secondhand smoke (SHS). Yet, the impact of SHS exposure on cancer treatment is unknown. A recent study has shown that exposure to SHS during head and neck squamous cell carcinoma (HNSCC) therapy is a significant independent predicator of HNSCC recurrence. Our study examines the effect of SHS smoke exposure on HNSCC cisplatin treatment and investigates the potential mechanisms leading to the observed effects.

METHODS: Sidestream smoke (SS), the main component of SHS, was extracted as previously described. Three different human HNSCC cell lines (UM-SCC1, WSU-HN6, and WSU-HN30) were exposed to SS extract for 48 hours at doses mimicking the nicotine levels observed in the saliva of passive smokers. Then, cancer cells were treated with cisplatin (0.1-100 μM) in the presence of SS extract. Cancer cell death and indefinite survival capacity were assessed with trypan blue staining and clonogenic survival assay, respectively. The cisplatin half-maximal inhibitory concentration (IC50) was determined for each cell line using GraphPad Prism software. The expression of ABCG2, a drug transporter associated with cisplatin resistance, was quantified using qPCR and Western blot analysis. Linear regression analysis was performed to evaluate the overall effect after adjusting data from all three cell lines.

RESULTS: Exposure to SS extract significantly decreased cell death ($P<0.0001$) and increased clonogenic survival capacity ($P<0.017$) in the cancer cells treated with cisplatin in the presence of SS extract, compared to cisplatin treated but unexposed HNSCC cells. Cisplatin sigmoidal dose-response curves indicate that cancer cells exposed to SS extract significantly increased their cisplatin resistance when compared to respective control cells: UM-SCC1 ($p<0.0001$), WSU-HN6 ($p<0.0035$), and WSU-HN30 ($p<0.0001$). The observed data indicate that in the presence of SS extract, cancer cells required a minimum of 1.5 to 2-fold increase in cisplatin concentration to reach IC50 in all three HNSCC cells. Compared to control, cells treated with SS extract, showed a significant increase in both mRNA and protein expression of ABCG2: UM-SCC1 ($p<0.0001$), WSU-HN6 ($p<0.031$), and WSU-HN30 ($p<0.003$). The linear regression analysis strengthens the observed overall increase in ABCG2 expression ($p<0.0001$). Our data suggest there is an active cisplatin efflux mechanism in the SS-treated cells.

CONCLUSIONS: Overall, our study documents for the first time that even short-term exposure to SHS can lead to cisplatin resistance in head and neck cancer cells by altering the expression of multidrug resistance and ability to evade cisplatin-induced cell death. Further studies in HNSCC patients-based observation are warranted. Our data stresses the urgent need for clinicians to consider the potential role of SHS exposure on treatment outcome and to advise cancer patients or caregivers of adults and children with cancer about the potential risks of SHS exposure during cancer treatment.

Funding: This work was partially supported by National Cancer Institute of the National Institutes of Health (R33CA202898, R01CA242168 and P30CA225520), the TSET Health Promotion Cancer Center, and the Oklahoma Center for Advancement of Science and Technology (HR16-007). Dr. Queimado holds a Presbyterian Health Foundation Endowed Chair in Otorhinolaryngology Position.

A007: STANDARDIZED FLUORESCENCE-GUIDED TORS USING AN INTEGRATED SIGNAL SOURCE

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Objective: Tumor resection continues to be the primary modality of treatment in most head and neck cancers. Since surgeons typically rely on the macroscopic appearance of the tumor, negative margins are not guaranteed; close surgical margins (<5mm) are found in 15-30% of head and neck cancer cases.

Recent advances in fluorescence-guided surgical techniques have aided surgeons in better intra-operative delineation of tumor margins, thereby reducing the possibility of positive or close margins. The 'Advanced Firefly™' (Intuitive, Sunnyvale, CA) is one

such imaging advancement available in transoral robotic surgery (TORS) to detect tumor-specific fluorescence in patients who have been administered preoperatively with an optical agent, such as panitumumab-IRdye800.

Here, we evaluate the accuracy of normalized fluorescence signal to delineate tumor from normal tissue in patients receiving panitumumab-IRdye800 prior to TORS.

Methods: Consenting patients (n=4) undergoing TORS for biopsy-confirmed oropharyngeal squamous cell carcinoma received 50mg panitumumab-IRDye800 48 hours prior to surgery. The patients underwent TORS with tumor resection as the standard of care. Fluorescence imaging was performed using 'Advanced Firefly'. Images were processed using MATLAB™ and the brightest frames were selected. Various areas of interest from these frames were analyzed using ImageJ™. To achieve a standardized fluorescence ratio (SFR) for comparison, fluorescence counts from areas of interest were collected and divided by fluorescent counts acquired from the robot manipulator instrument within the same field of view. The areas of interest were then correlated with histology and an SFR threshold was identified that delineated tumor from normal tissue.

Results: With the available 2000 data points from one patient, pathology-confirmed tumor tissues produced 63.3 ± 8.7 counts which were significantly higher (p=0.02) than pathology-confirmed normal tissues, 2.1 ± 1.7 counts. The mean counts of the instrument were on average 49% lower than the tumor tissues and 15% higher than normal tissues within each frame analyzed. The dynamic ranges of tumor, normal, and instrument counts were 32.0-81.2, 0.0-8.3 and 0.1-82.0 counts, respectively. The mean SFR for tumor tissues (254.5 ± 11.5) were significantly higher (p=0.02) than normal tissues (3.1 ± 0.33). Receiver operator characteristic curves revealed an SFR threshold of 2.0, with a sensitivity of 93.7% and specificity of 7.8%, to predict the presence of cancer in the field of view.

Conclusion: This technique can be used for surgeries in the future to predict the likelihood of cancer to ensure more accurate and precise resection of the tumor, thus increasing the probability of negative margins.

A008: DEEP LEARNING IMPROVES DETECTION OF OROPHARYNGEAL CARCINOMA USING MULTISPECTRAL NARROW-BAND ENDOSCOPIC IMAGING: FINAL RESULTS FROM A PROSPECTIVE CLINICAL STUDY

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Importance: Artificial intelligence (AI) is transforming clinical medicine. Computer vision, the field of AI focused on automatic interpretation of visual data, is already being used in radiology, pathology and dermatology, where standardized imaging methods and large datasets of annotated images are an essential element of the clinical workflow. Laryngopharyngeal endoscopy is an essential element of tumor staging for the head and neck oncologist faces many visual tissue discrimination tasks that remain challenging even when aided by optical magnification in discerning oropharyngeal carcinoma. Deep learning may be able to improve tumor staging and thus improve outcomes.

Objective: We hypothesize that there is clinically valuable and objective visual information that can be discerned using multispectral imaging of human tissues. The purpose of this study was to demonstrate OPC discrimination by applying machine learning and computer vision algorithms to multispectral images of tissue acquired with Multispectral Narrow Band Endoscopic Imaging

Materials and Methods: Multispectral narrow-band imaging (msNBI) was used to examine the lymphoepithelial tissues of the oropharynx in a prospective study of 60 patients (30 with biopsy-proven OPC, 30 patients without OPC). From each high-definition video, recorded at 30 fps, an average of 8 standard images. An end-to-end pipeline for data ingestion, processing, training, and inference was created. We conducted k-fold cross-validation with k=5 on all steps of the training and inference pipeline for both the cropping model. Experienced surgeons employed a web-based annotation tool, along with computer tablets and styluses (Wacom Co., Ltd; Saitama, Japan), to annotate fine-grained manual segmentations. A cropping model employing a ResNeXt50-32x4d convolutional neural network backbone was then used to predict tumor versus normal, using histologic ground-truth of oropharyngeal biopsy.

Results: When trained on both color and texture features, the neural network classified OPC under msNBI with 92% accuracy and 0.9497 area under the ROC curve (AUC), exceeding the performance of our prior model and a variety of other commonly-used supervised machine learning algorithms (Naïve Bayes, support vector machine, etc.; accuracy ranging from 81 to 87%). Texture features were essential to the model's performance, as a neural network trained on color features only detected OPC with 63.3% accuracy.

Conclusions and Relevance: Our study is the first to demonstrate the feasibility of deep learning to classify and to objectively distinguish clinically significant differences between tumor and normal using narrow-band imaging. We further hypothesize that there is characteristic visual information based on the molecular composition of tissues that may aid physicians and surgeons in clinical diagnosis and treatment of OPC.

A009: ASSESSING THE IMPACT OF DISCOVERY LEARNING IN A MANDIBLE RECONSTRUCTION SIMULATION MODEL

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Introduction: Mandibular reconstruction with microvascular free tissue transfer is a competency of head and neck microvascular surgery. Given the critical nature of the procedure, learning opportunities can be limited in the operating room. Simulation has been a tool used increasingly for surgical training. We thus explored whether a virtual surgical planning simulation could be beneficial to teach residents mandibular reconstruction with a fibular graft. The utility of discovery learning was examined and whether the order of didactic instruction and hands on experience affected learning outcomes.

Methods: Surgical residents and fellows at a tertiary care centre were enrolled in a mandibular reconstruction simulation course in 2019 and 2021. An in-house virtual surgical planning model was used for the simulation. Construct and face validity were validated. Both cohorts received didactic instruction with demonstration and hands on practice. One cohort received hands-on practice first (Do then See) while the other received didactic instruction first (See then Do). Participants then performed guided mandibular

reconstruction with a simulated mandible and fibula model. Outcomes included pre-simulation and post-simulation surveys assessing difficulty and understanding of reconstruction, and learner confidence on a Likert scale from 1-7. Accuracy of reconstruction was measured by assessing differences in length, width and projection of reconstructed mandibles compared to an ideal reconstructed model.

Results: 10 learners performed Do then See while 8 learners performed See then Do. Learners rated that models had dimensions and a layout similar to those found in a real patient (5.94) confirming face validity. There was no significant difference between accuracy in reconstruction between junior and senior residents when comparing differences in width (0.86 vs 0.88 cm, p=0.94), length (0.65 vs. 0.55 cm, p=0.71) or projection (0.98 vs. 0.65 cm, p=0.20). Learners had significantly higher post-simulation vs. pre-simulation ratings on the likelihood of performing a mandibular reconstruction adequately in Do then See (4.98 vs 3.80, p=0.01) and See then Do (5.22 vs 3.70, p<0.01). There was no significant difference between post-simulation ratings on likelihood of performing adequate reconstruction when comparing Do then See to See then Do (4.98 vs. 5.21, p=0.24). Accuracy was not significantly different between Do then See and See then Do when assessing width (0.59 vs 1.03cm, p=0.07), length (0.66 vs. 0.61cm, p=0.87) and projection (0.77 vs. 0.87cm p=0.72)

Discussion: The face validity of this low cost simulation was confirmed. Construct validity was not confirmed as junior and senior learners performed similarly on the reconstruction. However, this may be as a result of the sample size and limited experience of senior learners in performing mandibular reconstructions.Learners rated a perceived increase in understanding of mandibular reconstruction, anatomy of reconstruction and technical skills. There was no difference in outcomes between the two learning groups. Simulation is an effective tool to teach learners basic fundamental skills and allows opportunities to gain experience in high stakes or rare procedures. Overall, this demonstrates the potential learning benefits of a simulation model for mandibular reconstruction. Further studies with a larger sample size would strengthen the support for this model.

A010: TRACHEOSTOMY AND LARYNGECTOMY EDUCATION FOR HEALTHCARE PROVIDERS

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Background: Currently, very little research exists regarding the most effective way of teaching hospital staff how to identify the difference between and manage patients with laryngectomy and tracheostomy. These patients represent a high-risk patient population due to the risk of airway obstruction secondary to inadequate airway tube care and mucus plugging. This study compares educational techniques, both didactic and in-person skills training, and examines improvement in hospital staff knowledge.

Method: Sixty-five participants were included in this prospective study, which included Emergency Department staff nurses, residents and advanced care providers. Each subject completed a required, pre-requisite online session that included a pre-test and self-assessment, an educational lecture, followed by a post-test and self-assessment. Each subject participated in a simulation lab. Participants were randomized into the intervention or the control group. Once in the simulation lab, participants completed a pre-simulation self-assessment, then four simulation skill stations, which addressed pre-defined skills and case scenarios. Participants in the intervention group then viewed a didactic video, then completed the same four skills stations. The control group viewed the didactic video after completing the four skills stations a second time, such that control group performed the skills in the simulation without any video intervention in between. Post-test assessments were completed by all participants. The skills performed were audiovisually recorded and each video was graded on a pre-determined grading system by three study personnel. Pre and post quiz and practical scores were compared using paired t-test when comparing within groups and independent t-test across groups.

Results: Both the intervention and the control groups in the cohort showed improvements in post-test assessments including the quiz (control arm P = 0.0008, intervention arm P = 0.0007), self -assessment (control arm P < 0.0001, intervention arm P < 0.0001), and practical skills assessment (control arm P < 0.0001, intervention arm P < 0.0001). There were no significant baseline differences in pre-test scores between the intervention and control arm. Lastly, there were no significant differences observed between groups in post-test scores.

Conclusion: This study demonstrates a global increase in hand-on clinical skills and self-assessment scores for participants regardless of receiving an additional teaching video during the hands-on clinical skills session when participating in an educational course of laryngectomy and tracheostomy care. The addition of a video lecture to a hands-on skills course may be of limited utility.

A011: ELDERLY HEAD AND NECK CANCER PATIENT PRIORITIES

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Introduction: Patient-centered care has become increasingly important with providers focusing on collaborating with patients and their families to provide care that respects the patient's values and preferences. To successfully provide patient-centered care, it is critical to understand patients' health-related priorities and goals. Previous studies have examined the priorities of head and neck cancer patients; however, elderly head and neck cancer patients are a uniquely vulnerable population, and little is known about their health-related priorities.

Methods: Following Institutional Review Board approval, a cross-sectional study was conducted to examine the priorities of elderly head and neck cancer patients. Patients who presented in 2019 and 2020 and were at least 75 years of age at first diagnosis of head and neck cancer were considered for the study. Patients who were newly diagnosed and not yet treated (pre-treatment group) or patients who were more than 1-year post-diagnosis (post-treatment group) were included in the study. Clinicopathologic data were collected. A comprehensive geriatric assessment was conducted on each patient including a depression screen (PHQ8), a dementia screen (Mini-Cog), walk speed (time to walk 15 feet), frailty (Fried's), quality of life (FACT-H&N v4), social support (MOS SS), and functional status (ADLs, IADLs). The primary outcome was the Chicago Priority Scale which consists of ranking 12 health-related priorities relevant to head and neck cancer patients.

Results: A total of 32 patients met inclusion criteria, 13 in the

pre-treatment group and 19 in the post-treatment group. Median age was 82 years. The cohort included 17 males and 15 females. There were 18 primary mucosal malignancies and 12 salivary or cutaneous malignancies, and there were 13 patients who presented with early-stage disease and 18 patients with advanced-stage disease. In the geriatric assessment, there was no difference between pre-treatment and post-treatment groups. Cure was the highest ranked priority for both pre-treatment and post-treatment groups and was ranked significantly higher than any other priority ($p<0.001$). Longevity was the next highest priority. There were no significant differences in priorities between pre-treatment and post-treatment groups. Among post-treatment patients, both swallowing and taste/smell were ranked significantly higher priorities for patients treated non-surgically compared to patients treated with surgery alone ($p<0.001$ and $p<0.001$). Conversely, appearance was ranked significantly higher priority for patients who were treated surgically compared to patients treated non-surgically ($p<0.001$).

Conclusions: Cure is the most important health-related priority among elderly head and neck cancer patients. Overall, priorities did not differ significantly between pre-treatment and post-treatment groups. The majority of clinicopathologic and geriatric variables did not reliably predict patient priorities. This emphasizes the importance of good communication with patients and their families to determine what is uniquely important to each individual patient.

A012: TARGETING THE REBELLION: CANCER PREVENTION THROUGH HUMAN PAPILLOMA VIRUS VACCINE EDUCATION OF COLLEGE STUDENTS

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Importance: Human Papilloma Virus related Oropharyngeal Squamous Cell Carcinoma (HPV OPSCCa) has become the most common cause of OPSCCa, and the most common cause of HPV related cancers. The Gardasil-9 vaccine against HPV has been approved by the Food and Drug Administration for the prevention of HPV OPSCCa. Despite this, less than 50% of adolescents in the United States are fully vaccinated against this virus.

Objective: To develop a cancer prevention program targeted toward college students to increase the rates of HPV vaccination in this population.

Design, Setting, and Participants: The cancer center at a tertiary academic hospital partnered with college wellness peer educators. A lecture on HPV related cancers and prevention with vaccination was developed, advertised for on campus, and was delivered on campus to an audience of college students.

Methods: Initial education was provided to peer wellness educators, and advertisement was developed with their assistance that would be attractive and effective for college students. A lecture was given to college students on campus. A pre- and post-test was provided at the beginning and end of the lecture via QR code to evaluate usefulness and effectiveness.

Results: Forty-six students attended the lecture. One-third (32.6%) of attendees were either not vaccinated, or unsure of their vaccine status. Only Two-thirds (67.4%) of the attendees knew that HPV could cause cancer. After the lecture, 100% of attendees knew that HPV can cause cancer, and 100% also knew that HPV related cancers can be prevented. Of those who were unvaccinated, 74.4% reported that they planned to get vaccinated against the disease as a result of the lecture.

Conclusions: Educational lectures on HPV vaccination can be an effective means of cancer prevention in the college student population.

A013: PREDICTING INTERMEDIATE CARE DISCHARGE FOLLOWING HEAD AND NECK CANCER SURGERY

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Importance: Discharge to an intermediate care facility following oncologic surgery places an increased burden on resource allocation in public health care systems. Although several risk factors for non-home discharge have been identified in head and neck cancer patients, a pragmatic risk index predicting discharge location is lacking.

Objective: To develop a preoperative predictive index of intermediate care discharge for patients undergoing head and neck cancer surgery.

Design: Retrospective cohort analysis of patients registered in the American College of Surgeons National Surgical Quality Improvement Program (ACS NSQIP) from 2006 to 2016.

Setting: Multicenter study of patients recorded in the NSQIP participant user files.Participants: Patients undergoing inpatient head and neck cancer surgery, excluding endocrine surgeries registered in the NSQIP.

Exposure: Sociodemographic, clinical and surgical factors in the derivation cohort were evaluated using simple and multiple logistic regression. Predictor variables were subsequently integrated into a risk model using the validation cohort.

Main Outcomes and Measures: Discharge to an intermediate care institution, including skilled, unskilled, acute and rehabilitation facilities, following head and neck surgery.

Results: A total of 13 696 operations were found using the ACS NSQIP database from 2006 to 2016. A total of 934 (6.8%) patients were discharged to an intermediate care facility. Predictors of discharge location were advanced age, female sex, hypertension, chronic obstructive pulmonary disease, chronic steroid use, current smoker, leukocytosis, anemia, hypoalbuminemia, weight loss, functional loss, surgical time, free tissue transfer and tracheotomy. These variables were independently associated with postoperative discharge to an intermediate care facility on multiple regression analysis. Using the validation cohort, the final model provided a sensitivity of 85.9% (95% confidence interval of 81.7-89.5), specificity of 73.4% (95% confidence interval of 72.4-74.4) and a c-statistic of 0.87 (95% confidence interval of 0.86-0.89).

Conclusion and Relevance: The above risk index predicts discharge to an intermediate care institution in patients undergoing head and neck cancer surgery with high accuracy. This model may be of use for preoperative patient counselling and resource allocation.

POSTER LISTINGS

A014: THE IMPACT OF AN ONCOLOGY NURSE NAVIGATOR ON TREATMENT TIMELINES AND ADHERENCE IN AN UNDERSERVED URBAN POPULATION

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Background: Oncologic outcomes for patients with head and neck squamous cell carcinoma (HNSCC) are impacted by time to treatment initiation (TTI) and adherence to therapy. Our patient population is composed primarily of residents from Bronx, NY: one of the poorest counties in the country. Previous data from our institution demonstrated that patients who experience TTI more than 60 days had approximately double the risk of mortality and disease recurrence. The results also demonstrated that those patients who were at highest risk for TTI delay were African American and Medicaid patients. In an effort to address these issues, we planned an intervention utilizing an oncology nurse navigator with a customized navigation portal within the electronic health record starting in June 2020. We measured the impact of this intervention on treatment timelines and prescribed therapeutic completion rates.

Methods: This was a retrospective study examining two cohorts: 1) newly diagnosed HNSCC patients from 2019 prior to implementing the nurse navigator and newly diagnosed HNSCC patients from June 2020 to July 2021 - the first year during which navigation was implemented. The first 6 months of 2020 were not included due to the COVID pandemic significantly altering care delivery at our institution. The following outcomes were measured: time to diagnosis, TTI, time to medical and radiation oncology appointments, time to adjuvant treatment, time to PET CT scan, and total no show appointments. Patients' race, ethnicity, and county of residence were also recorded.

Results: There were 84 patients in the pre-navigation group and 60 patients in the post-navigation group. Four outcomes showed statistically significant differences: TTI - mean 40.1 days (SD 34.6, 95% CI 27.0, 42.1) vs 28.5 days (SD 17.8, 95% CI 13.1, 22.5) in the pre- vs post-navigation group (p = 0.01), time to PET CT - mean 32.9 days (SD 38.0, 95% CI 27.6, 48.5) vs 19.1 days (SD 15.3, 95% CI 9.8, 18.9) in the pre- vs post-navigation group (p = 0.02), total missed appointments - mean 8.4 days (SD 7.7, 95% CI 6.0, 9.3) vs 4.8 days (SD 4.6, 95% CI 3.4, 5.7) in the pre vs post-navigation group (p = 0.001), and time to medical oncology (MO) - mean 41.8 days (SD 43.5, 95% CI 32.3, 54.7) vs 27.7 days (SD 20.0, 95% CI 14.0, 26.1) in the pre vs post-navigation group (p = .03). Additionally, after navigation was implemented, the number of patients who experienced TTI>60 days was reduced from 11/84 (13%) to 1/60 patients (1.6%).

Conclusion: Our data suggests that with the implementation of an oncology nurse navigator, there was a significant decrease in TTI, time to PET CT and MO, and total no show appointments. Additionally, there was a significant decrease in patients that experienced a TTI > 60 days. Given the socioeconomic and racial disparities associated with treatment delay, an oncology navigator can serve as a valuable resource for supporting patients with newly diagnosed head and neck cancer through their complicated treatment courses and potentially help address inequalities in head and neck cancer outcomes.

A015: PATIENT AND PROVIDER OUTCOMES BEFORE AND AFTER ENHANCED RECOVERY AFTER SURGERY (ERAS) IMPLEMENTATION FOR HEAD AND NECK FREE FLAP SURGERY

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Importance: Enhanced Recovery After Surgery (ERAS) protocols have improved patient outcomes after complex surgeries within multiple specialties. Recent literature on head and neck ERAS protocols, while sparse, demonstrated an association with improved pain, shorter length of stay, and fewer complications. However, prior published head and neck ERAS pathways lack day-to-day specific guidelines, which is especially crucial in the multidisciplinary care of free flap patients. In addition to detailed patient outcomes, there are no head and neck surgery studies to date that assessed provider perspectives before and after ERAS implementation

Objectives: To comprehensively evaluate patient postoperative outcomes and provider perspectives on the safety, stress, and predictability of head and neck free flap care.

Design, Setting, Participants: A single-center retrospective cohort study of consecutive patients who underwent head and neck free flap reconstructive surgery between July 1, 2018 and December 31, 2018 before ERAS implementation and between July 1, 2019 and December 31, 2019 after ERAS implementation was conducted. Providers, including attendings, residents, midlevel providers, and nurses, were separately queried about their opinions regarding free flap patient care via survey before and after implementation. The protocol addresses postoperative analgesia, tube feeding, flap checks, wound care, tracheostomy care, antibiosis, aspirin, in-hospital transfers, and speech-language pathology involvement stratified by postoperative day.

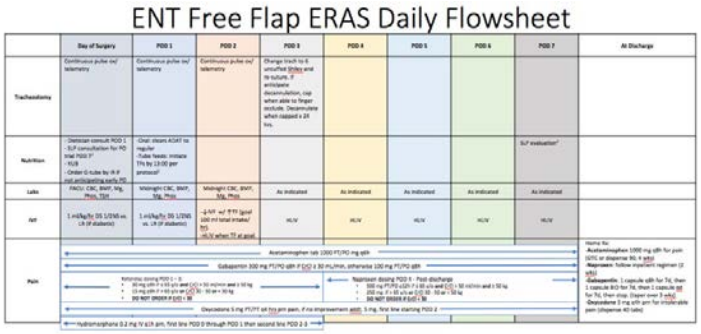
Main Outcomes and Measures: The primary outcomes were morphine milligram equivalents (MME), length of stay, and provider survey scores. Secondary outcomes were complications, intensive care unit (ICU) admission, progressive care unit (PCU) length of stay, antibiotic duration, and 30-day readmission.

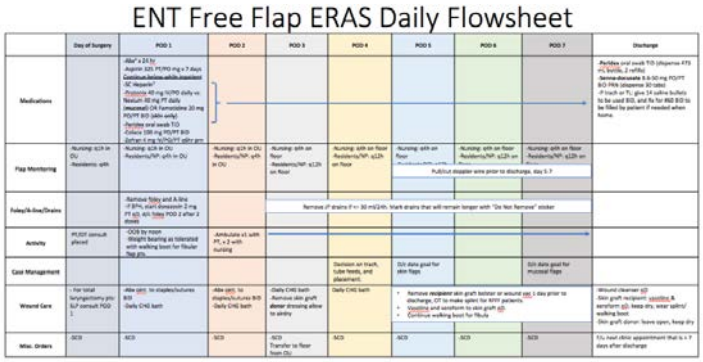
Results: In total, 175 patients (mean age 63.0 [12.4] years, 57 females [33%]) were included, of whom 77 (44%) had surgery before ERAS and 98 (56%) had surgery after ERAS. There were no significant differences in baseline characteristics between the two cohorts. Median MME was much higher in the pre-ERAS cohort (difference 80.5 [95% CI 17.5-157.5]). There was no difference in total length of stay (median difference 0.0 [95% CI -1.0 to 1.0] days). There were also no differences in rates of flap failure, surgical site infection, fistula, hematoma, unplanned operative intervention, ICU admission, and 30-day readmission between the two cohorts. Antibiotic duration was much lower in the ERAS cohort (median difference 3.4 [95% CI 2.0-3.9] days).

Of 106 survey responses, 45 providers (42%) completed the survey before ERAS, and 61 providers (58%) completed it after ERAS implementation. Providers reported a significant increase in ability to anticipate pain management and overall management of free flap patients (difference 21.8% [95% CI 7.8%-35.8%]). Compared to pre-ERAS implementation, 33/40 (73%) reported their ability to anticipate the step-by-step management to be better, and 20/40 (50%) and 30/40 (75%) reported free flap care to be less stressful and safer, respectively.

Conclusions and Relevance: Instituting a head and neck free flap surgery ERAS protocol is associated with decreased narcotic use, antibiotic use, and lengthy PCU stay. It is also associated with decreased provider stress, increased impression of patient safety,

and improved ability to anticipate step-by-step management of these patients.





A016: ADDRESSING THE HEALTH DISPARITIES IN HEAD AND NECK CANCER AMONG BLACK AMERICANS: ASSESSING PERCEPTIONS AND AWARENESS OF THE DISEASE.

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The disparities in head and neck cancer (HNC) among Black Americans remain stark. Black Americans present with a higher incidence rate and advanced disease at diagnosis. Even as early as within 90 days of treatment, higher rates of mortality are noted among Black Americans after adjusting for age, stage, primary tumor site, HPV status, and treatment type. This points to Black American status as an independent risk factor for HNC mortality, with a multidimensional etiology, rather than a mere reflection of socioeconomic differences. We must elucidate the underlying reasons for this disparity in incidence and outcomes in order to achieve health equity amongst HNC patients.

Awareness and perception of HNC have been studied in different groups globally and appear to be low across populations. However, whether this is a possible contributor to the greater burden of HNC among Black Americans, remains largely unexplored. We hypothesize that gaps in knowledge of HNC and risk perception will become targetable for intervention to combat disparities for HNC in Black Americans. We are currently conducting an online survey of adult Black Americans in the city of Pittsburgh. All participants receive a pre-intervention survey, an intervention (educational video – 13 minutes), and then an immediate post-intervention survey.

We have collected data from 46 respondents, 45 of whom identified as Black/African American (97.83%). 86.05% of our respondents identified as female, and the ages ranged from 21 – 59. 43.9% of our participants had completed a bachelor's as their highest level of education and 51.22% had full-time employment. The majority of our group had never smoked cigarettes (73.17%), and 56.10% endorsed current alcohol usage. Half of our respondents had never heard of HNC (48.78%), and about the same proportion accurately defined HNC (56.25%). Participants correctly selected 7/30 possible risk factors that can lead to HNC 46.9% of the time, with cigarette smoking and family history with the highest selections. The majority of participants (92.68%) recognized that early diagnosis of HNC improves recovery. Lastly, 58.54% of participants were not aware of any HNC screening programs, and only 43.42% knew an otolaryngologist or ENT would be the physician to treat HNC. After our intervention, 91.89% correctly defined HNC, and participants correctly selected the 7/30 possible risk factors that can lead to HNC 52.34% of the time, with smoking cigarettes, chewing tobacco, and drinking too much alcohol having the highest selections. 91.89% of participants also subsequently correctly identified an otolaryngologist or ENT as the appropriate physician to manage their HNC treatment.

Our investigative survey revealed specific opportunities for patient education on HNC risk and diagnosis among Black Americans in Pittsburgh, a population at-risk for poor HNC outcomes. Our quick inexpensive educational video served as a targeted intervention that closed certain knowledge gaps. We hope that this study will provide a foundation for future interventions to increase awareness of HNC among Black Americans and subsequently all populations at risk of this disease.

A017: EVALUATION OF A TEXT-BASED PEER MENTORSHIP PROGRAM FOR HEAD AND NECK ONCOLOGIC/ MICROVASCULAR SURGEONS

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Background: Burnout has been previously identified in head and neck oncology/microvascular surgeons (HNMVS). Among long hours and patient care demands, lack of mentorship was identified as one of the most significant contributing factors. Mentorship programs have been found to be protective, however, are not widely utilized. A prior grassroots text-based mentorship group had garnered anecdotal success. Thus, we proposed that a text-based peer mentorship program can help augment formal mentorship paradigms and provide a venue for clinical, personal, and career growth.

Methods: With approval from the American Head and Neck Society Mentorship Committee and using the prior mentorship group as a model, we surveyed the AHNS membership for interested parties. From these volunteers, 4 groups were formed of similar size. Participants were assigned to groups randomizing those who were early career (< 5 years in practice) with more senior members. Texts from pilot groups were analyzed. Questions were categorized by content, number of and time to responses, and presence of a resolution to the question. A survey was administered to participants of all groups to assess their participation and experiences with the platforms. Results were compared between pilot groups and established groups.

Results: A total of 49 participants were enrolled in the pilot groups. Member attrition resulted in a final enrollment of 42 participants at 2 years. Group longevity ranged from 5 months - 2 years. The majority of questions involved reconstruction (58%).

Only 2 questions (5.4%) went unanswered. The average time to first response was 76.8 minutes, with a median time of 12 minutes. There were > 2 responses were received on average for each new question. Pilot group survey data showed 3 (38%) of respondents felt participation changed practice patterns, and 1 (12%) formed a research collaboration. In contrast, survey results for established mentor groups showed 14 (82%) felt participation changed their practice patterns, 11 participants (65%) formed research collaborations, 10 (59%) had publications, and 4 (24%) had national presentations arise from their participation. The primary factors in pilot group respondents limiting participation were 'unfamiliarity with participants' and the 'ability to obtain support elsewhere'. Having an in-person meeting of the group was felt to be beneficial by 5 (63%) of pilot group respondents and 9 (53%) of established mentor group respondents.

Conclusions: Text-based peer mentorship is a novel method of supporting surgeons with the advantages of timely access to peers for clinical concerns and research collaboration. Preliminary data from pilot text-based mentorship groups shows that asked questions had a high response rate, quick time to answer, and multiple responses. Additionally, data from established text-based mentorship groups shows that participation positively impacted clinical practice and the majority of participants were able to form productive research collaborations. In-person introductions can help expand participant familiarity and allow greater participation among new groups. Text-based peer mentorship should continue to be explored as a method to support HNMVS during their careers.

A018: REGIONALIZATION OF HEAD & NECK ONCOLOGY TUMOR BOARDS: PERSPECTIVES OF COLLABORATING PHYSICIANS

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Introduction: Multidisciplinary tumor boards (MTB) are widely used in the management of head and neck cancer and positively impact both patient outcomes and adherence to clinical practice guidelines. The COVID-19 pandemic has largely transitioned tumor boards from an in-person to a virtual setting. Virtual tumor boards may improve access of community-based cancer centers to the resources and expertise of large academic institutions. The purpose of this study is to survey participating physicians to better understand the utility and effectiveness of interinstitutional head and neck cancer programs that co-host virtual MTBs.

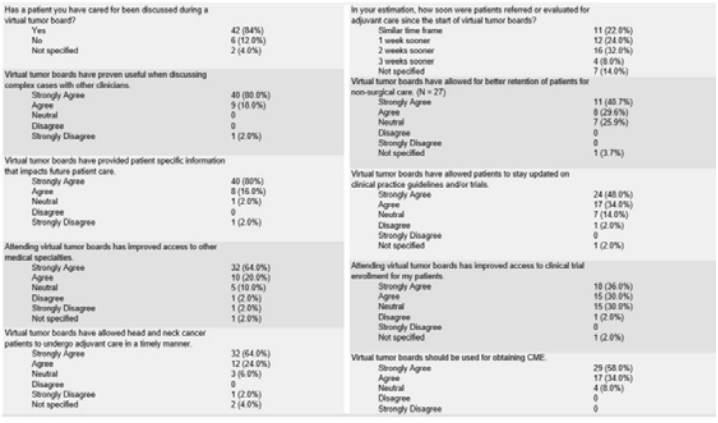
Methods: This anonymous survey study included individuals that participated in a head and neck virtual MTB during the COVID-19 pandemic. Data obtained includes demographic variables such as gender, years in practice, specialization, and practice facility type. Subsequent survey questions assessed physician agreement with various statements regarding virtual tumor boards to understand physician preferences and priorities using this platform. Subset analysis using Pearson's chi-square test was performed to evaluate any differences in survey responses based on cancer care specialty or practice location.

Results: 50 survey responses were obtained out of 89 recipients. Non-response rate was 44%. Survey participants included 11 surgeons, 19 radiation oncologists, 8 medical oncologists, with the remaining participants being pathologists, neuroradiologists, or other cancer care coordinators. Thirty-nine respondents (78%) practiced at community cancer centers with the remaining eleven (22%) practicing at an academic medical center (Table 1). Greater than 96% of participants found MTB to be useful when discussing complex cases and impactful to future patient care. 84% and 66% found MTB to improve access to other medical specialties and clinical trial enrollment for patients, respectively (Table 2). Survey responses differed significantly between oncologists located at an academic center compared to a community hospital. Compared to oncologists at academic centers, oncologists at community cancer centers found virtual MTB to be more useful and impactful to patient care ($p<0.001$), increased access to other medical specialties ($p=0.014$), and improved time to adjuvant therapy ($p=0.012$). Subset analysis revealed no significant differences in survey responses between surgeons, radiation oncologists, and medical oncologists.

Conclusions: Virtual tumor boards are an effective platform for the multidisciplinary management of head and neck cancer patients across high-volume academic and community-based cancer centers. Overall, providers across all specialties and locations view virtual MTB favorably with improvement in care communication and coordination. Virtual MTB may improve access to other medical specialties and clinical trials, particularly for providers based in community and/or regional locations.

Total Responses	50
Gender	
Male	23 (46.0%)
Female	23 (46.0%)
Unknown	4 (8.0%)
Years in Practice	
<1 year	1 (2.0%)
1-5 years	10 (20.0%)
6-10 years	9 (18.0%)
11-20 years	13 (26.0%)
>20 years	17 (34.0%)
Cancer Care Service	
Surgeon	11 (22.0%)
Radiation Oncologist	19 (38.0%)
Medical Oncologist	8 (16.0%)
Pathologist	2 (4.0%)
Neuroradiologist	2 (4.0%)
Other	8 (16.0%)
Practice Location	
University of Maryland Medical Center	11 (22.0%)
Regional Hospital/Cancer Center	25 (50.0%)
University of Maryland Medical System Hospital	13 (26.0%)
Not specified	1 (2.0%)

Table 1: Demographics of survey respondents



Has a patient you have cared for been discussed during a virtual tumor board?	
Yes	42 (84%)
No	6 (12.0%)
Not specified	2 (4.0%)
Virtual tumor boards have proven useful when discussing complex cases with other clinicians.	
Strongly Agree	40 (80.0%)
Agree	9 (18.0%)
Neutral	0
Disagree	0
Strongly Disagree	1 (2.0%)
Virtual tumor boards have provided patient specific information that impacts future patient care.	
Strongly Agree	40 (80%)
Agree	8 (16.0%)
Neutral	1 (2.0%)
Disagree	0
Strongly Disagree	1 (2.0%)
Attending virtual tumor boards has improved access to other medical specialties.	
Strongly Agree	32 (64.0%)
Agree	10 (20.0%)
Neutral	5 (10.0%)
Disagree	1 (2.0%)
Strongly Disagree	1 (2.0%)
Not specified	1 (2.0%)
Virtual tumor boards have allowed head and neck cancer patients to undergo adjuvant care in a timely manner.	
Strongly Agree	32 (64.0%)
Agree	12 (24.0%)
Neutral	3 (6.0%)
Disagree	0
Strongly Disagree	1 (2.0%)
Not specified	2 (4.0%)
In your estimation, how soon were patients referred or evaluated for adjuvant care since the start of virtual tumor boards?	
Similar time frame	11 (22.0%)
1 week sooner	12 (24.0%)
2 weeks sooner	16 (32.0%)
3 weeks sooner	4 (8.0%)
Not specified	7 (14.0%)
Virtual tumor boards have allowed for better retention of patients for non-surgical care. (N = 27)	
Strongly Agree	11 (40.7%)
Agree	8 (29.6%)
Neutral	7 (25.9%)
Disagree	0
Strongly Disagree	0
Not specified	1 (3.7%)
Virtual tumor boards have allowed patients to stay updated on clinical practice guidelines and/or trials.	
Strongly Agree	24 (48.0%)
Agree	17 (34.0%)
Neutral	7 (14.0%)
Disagree	1 (2.0%)
Strongly Disagree	0
Not specified	1 (2.0%)
Attending virtual tumor boards has improved access to clinical trial enrollment for my patients.	
Strongly Agree	18 (36.0%)
Agree	15 (30.0%)
Neutral	15 (30.0%)
Disagree	1 (2.0%)
Strongly Disagree	0
Not specified	1 (2.0%)
Virtual tumor boards should be used for obtaining CME.	
Strongly Agree	29 (58.0%)
Agree	17 (34.0%)
Neutral	4 (8.0%)
Disagree	0
Strongly Disagree	0

Table 2: Survey results

POSTER LISTINGS

A019: REPRODUCTIVE FACTORS, OBESITY, AND RISK OF THYROID CANCER AMONG WOMEN: A MULTICENTER RESEARCH NETWORK ANALYSIS

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Background: Thyroid cancer rates have increased over the past few decades because of increased scrutiny and in part because of a real rise in incidence. Thyroid cancer is overwhelmingly a women's disease. Prior research has indicated that reproductive factors, hormones, and obesity may contribute to the risk of developing thyroid cancer. In the current study, we aimed to elucidate the role that female reproductive hormones may play by analyzing the association of thyroid cancer with various conditions related to altered hormone states in women of reproductive age.

Methods: This retrospective study used electronic medical record data for women ages 18-60 obtained from the TriNetX Research Network. Hormonal risk factors including uterine fibroids, oral contraceptive pill use, oophorectomy, and estrogen replacement therapy (ERT) were selected for this analysis. Eighteen data queries were performed to create study cohorts of women with /without a history of these conditions and with/without a diagnosis of thyroid cancer. The relationship between thyroid cancer and the hormone-related factors compared to obesity was evaluated by estimating the relative risk of thyroid cancer between cohorts.

Results: Our sample consisted of 23,011,900 women aged 18-60 in the research network, of which 50,746 had a diagnosis of thyroid cancer (0.22%). All conditions analyzed were associated with a statistically significant change in thyroid cancer risk ($p<0.001$). Obesity and uterine fibroids were associated with a similar relative risk of RR= 2.77 (95% CI [2.72-2.82]) and 2.94 (95% CI [2.84-3.04]), respectively. A higher risk was associated with oophorectomy with and without ERT, with RR= 12.42 (95% CI [10.54-14.63]) and 3.39 (95% CI [3.06-3.75]), respectively. Oral contraceptive pill use was associated with a significant decrease in the risk of thyroid cancer, with RR=0.78 (95% CI [0.73-0.83]).

Conclusion: Our results show that altered hormone states may impact thyroid cancer risk more than obesity. We found that oophorectomy with and without ERT was associated with a higher relative risk compared to obesity. Oophorectomy with ERT was associated with the most significant risk increase, with a thyroid cancer risk 12.42 times higher than that of patients who did not undergo this treatment pathway. On the other hand, oral contraceptive pill use was the only condition associated with a risk reduction. Future studies are needed to help entangle the role that differences in estrogen levels and other hormonal factors may play in the pathogenesis of thyroid cancer.

A020: ANAPLASTIC THYROID CANCER MANAGEMENT AND OUTCOMES: 20-YEAR SINGLE INSTITUTION EXPERIENCE

Shannon S Wu[1]; Eric Lamarre, MD[2]; Anirudh Yalamanchali, MD, MS[2]; Philip Brauer[3]; Chandana A Reddy[2]; Emrullah Yilmaz, MD[2]; Neil Woody, MD[2]; Jamie Ku, MD[2]; Brandon Prendes, MD[2]; Christian Nasr, MD[2]; Mario Skugor, MD[2]; Katherine Heiden, MD[2]; Deborah Chute, MD[2]; Jeffrey Knauf, PhD[4]; Shauna R Campbell, DO[2]; Shlomo Koyfman, MD[2]; Jessica Geiger, MD[2]; Joseph Scharpf, MD[2]; [1]Cleveland Clinic Lerner College of Medicine; [2]Head and Neck Institute, Cleveland Clinic; [3]Case Western Reserve University School of Medicine; [4]Lerner Research Institute, Cleveland Clinic

Background: Anaplastic thyroid cancer (ATC) is a rare but aggressive disease with poor survival outcomes. The 2012 American Thyroid Association (ATA) guideline for treatment of ATC has been updated, with emphasis on rapid diagnosis, mutation assessment, surgical and non-surgical decision-making, and multidisciplinary care. This study reviewed our 20-year institutional experience treating ATC and retroactively assessed compliance with the 2021 ATA guidelines.

Methods: This retrospective review included patients with ATC treated between 2000-2020 at a tertiary, academic institution. Demographic, tumor, treatment, and outcome characteristics were collected. Patients who met at least one of the following criteria were classified as non-adherent to the updated ATA guideline: no laryngoscopy at time of diagnosis; stage IVC disease surgically treated; did not start adjuvant intent therapy within 6 weeks of surgery; had radical resection. Kaplan-Meier method and log-rank test modeled overall survival (OS) by treatment type and adherence. Systemic therapy included any chemotherapy, targeted therapy, or immunotherapy.

Results: Of 83 patients who met inclusion criteria, median age at diagnosis was 70.1 (range,38-93) years, 50 (60.2%) were female, 71 (85.5%) were Caucasian, 48 (57.8%) were never smokers. Forty-three (51.8%) patients were treated 2014-2020. Staging was 15 (18.1%) IVA, 18 (21.7%) IVB, and 42 (50.1%) IVC with metastases most commonly to the lung (n=36, 85.7%). Most (51.8%) tumors were diagnosed with other co-existing tumor types, most commonly papillary thyroid cancer. Mutational status was assessed in 40 (48.2%) patients; of these, 14 (41.2%) were BRAF-mutated. There were 7 NRAS, 6 p53, and fewer than 5 TERT promoter, PIK3CA, BCL6, PTEN, or ARID2 mutations. Laryngoscopy was performed at diagnosis in 71 (85.5%) patients. Thirty-six (43.4%) patients were treated with surgery, with 17 (47.2%) having positive margins. Twenty-one (58.3%) received adjuvant therapy within six weeks after surgery. Targeted/immunotherapy included dabrafenib/trametinib (n=10), lenvatinib (n=10), vemurafenib (n=2), sorafenib (n=2), pazopanib (n=4), nivolumab/ipilimumab (n=2). Median OS was 5.52 months. There were 38 (45.7%) patients whose treatment plans were adherent to ATA 2021 guidelines, and 45 (54.2%) who did not meet criteria for adherence. Median OS was 3.16 vs. 7.36 months for adherent and non-adherent, respectively ($p=0.115$). Median OS was improved in patients who had surgery (10.12 vs. 2.60 months, $p=0.03$), and in patients who received systemic therapy (10.48 vs. 1.91 months, $p<0.001$).

Conclusion: In our 20-year institutional experience with ATC, surgery was associated with significantly better OS despite positive margins being present in half of these cases. Systemic treatment was also associated with better OS but was not adjusted for staging at diagnosis. No significant difference in OS was observed when stratifying by adherence to ATA 2021 guidelines; however, larger, prospective studies are needed to better assess the prognostic impact of ATA guidelines on OS.

A021: TRANSORAL ENDOSCOPIC THYROIDECTOMY VIA THE VESTIBULAR APPROACH (TOETVA) IN PATIENTS WITH GRAVES' DISEASE: A NORTH AMERICAN CASE SERIES

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Objectives: Transoral endoscopic thyroidectomy via the vestibular approach (TOETVA) is an scar-less alternative to open transcervical

thyroid surgery. Given the novelty of TOETVA, limited literature has examined the technique's outcomes in patients with Grave's disease (GD) who often present with large goiters. This study aims to describe a multi-institutional experience performing TOETVA in this patient population.

Materials and Methods: The medical records of 44 GD patients who underwent total thyroidectomy via TOETVA at two academic institutions were retrospectively reviewed. The size, pathology, operative time, and post-operative complications of these patients were evaluated.

Results: The mean age of patients was 36 years (range 17-71, SD+/- 12 years) and 95% (42/44) were female. The mean operative time to complete TOETVA among GD patients was 204 min (range 70-453 min, SD +/-81min). The average thyroid sample weight was 33.7g (+/- 30.3g), and 9% (4/44) demonstrated micropapillary thyroid carcinoma on pathology. Thirteen patients (29%) experienced a post-operative complication, with the most common being hypoparathyroidism and chin numbness or asymmetry.

Conclusion: To our knowledge, this is the first case series describing TOETVA in this patient population. TOETVA presents a safe method for total thyroidectomy among patients with GD. Collation of more data on outcomes and complications is essential specific for this patient population as more cases are performed. A prospective study is currently enrolling participants.

A022: RISK STRATIFICATION OF LATERAL NECK RECURRENCE FOR PN1A PAPILLARY THYROID CANCER BASED ON THE NUMBER OF CENTRAL METASTATIC LYMPH NODES AND PRIMARY TUMOR SIZE

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Background: The prognostic significance of central lymph node (LN) metastases in lateral LN recurrence for papillary thyroid carcinoma (PTC) has been confirmed. However, the role of information related central LNs has not been well defined. The study aimed to evaluate whether this is applicable in identifying patients at high-risk of lateral LN recurrence.

Methods: From 2000 to 2016, continuous patients who underwent total thyroidectomy or lobectomy and unilateral central neck dissection and has no clinically suspicious metastatic LNs in the lateral neck in our institute were enrolled. The primary endpoint of study was structural recurrence of lateral LN. The association of numbers of central metastatic LNs and lateral LN recurrence was assessed using a Cox proportional hazards model with restricted cubic spline (RCS) and stratification analysis by Kaplan-Meier curves. Univariable and multivariable Cox proportional hazards models were used to establish the risk stratification system for lateral LN recurrence.

Results: Among 2500 patients, 96 (3.84%) patients underwent recurrence with a median follow-up of 62 months. According to the RCS, there was a significant overall association between number of central metastatic LN and lateral LN RFS and a significant nonlinear association was observed (P for number of central metastatic LNs <0.001, P for nonlinear <0.001), which underlines an increased number of central metastatic LNs was associated with increasing risk of lateral LN recurrence to six central metastatic LNs, after which any additional metastatic LNs did not confer increased risk. When further stratification, the optimal cutoff value of number of central metastatic LN was 3 (5-year lateral LN RFS 98.1% vs. 90.9%, P<0.001). After multivariate analysis, number of central metastatic LNs >3 and primary tumor size were the top two important risk factors. Patients with primary tumor size>2cm and the number of central metastatic LNs >3 have the highest risk of lateral neck recurrence, patients with microcarcinoma or primary tumor size 1-2cm combined the number of central metastatic LNs ≤3 have the lowest risk, and others have intermediate risk (high vs. intermediate vs. low, 5-year lateral LN RFS 98.3% vs. 92.9% vs. 78.5%, all P<0.001).

Conclusion: The number of central metastatic LNs and primary tumor size seem to have predicted value for lateral neck recurrence in PTC patients with central neck metastasis. Patients with the number of central metastatic LNs>3 or primary tumor size>2cm may need aggressive intervention.

Keywords: Papillary thyroid carcinoma; lateral neck recurrence; central lymph node metastasis; primary tumor size;

A023: NEOADJUVANT SELECTIVE RET INHIBITOR FOR MEDULLARY THYROID CANCER: A CASE SERIES

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Importance: There are limited treatment options for advanced medullary thyroid cancer (MTC). Selective RET inhibitors were recently approved by the Food and Drug Administration for MTC but only a single case documenting its efficacy as neoadjuvant treatment has been reported.

Objective: To report the first case series of patients with advanced MTC treated with selective RET inhibitor followed by surgery.

Design, Setting, and Participants: Consecutive case series in a tertiary care center of five adults with locoregional and distantly metastatic *RET*-mutated MTC from 2018-2021 followed for a mean of 1.8 years (median 1.5, range 0.8-3.4). Three patients have completed surgery; two additional patients will be reported at the time of the meeting.

Exposure(s): Neoadjuvant selective RET inhibitor Selpercatinib (LOXO-292) followed by surgery.

Main Outcome(s) and Measure(s): Pre- vs. post-neoadjuvant RECIST 1.1 response, MGH/MEE-MSK-MD Anderson (MMM) Surgical Morbidity Complexity Score, calcitonin, and survival.

Results: RECIST responses were 55.1%, 32.2%, and 30.8% (mean 39.4%). The mean improvement in MMM Surgical Morbidity Score was 1.0 (median 1, range 2-0). This correlated with an estimated necessary sacrifice of four recurrent laryngeal nerves (RLN) pre-neoadjuvant therapy, but only one RLN was sacrificed intraoperatively. The post-neoadjuvant calcitonin was on average 6.8% of the pre-neoadjuvant value. The last reported mean calcitonin was 17.0% of the pre-neoadjuvant value with one patient restarted on adjuvant selective RET inhibitor after surgery. Treatment was transiently held in one patient for hypertension;

otherwise, no significant side effects were reported. All patients are alive at a median follow-up of 1.5 years.

Conclusions and Relevance: Patients with metastatic MTC can achieve durable locoregional and distant control with the use of a selective RET inhibitor in the neoadjuvant setting. Clinical trials are needed to further evaluate this novel approach.

Table 1. Medullary Thyroid Cancer Patient Characteristics and Outcomes with Neoadjuvant Selective RET Inhibitor

Patient Number	Age	Pre-Neo Surgical Morbidity Score	Pre-Neo Calcitonin	Pre-Neo CEA	Post-Neo Surgical Morbidity Score	Post-Neo Calcitonin	Post-Neo CEA
1	25	4	11244	886	2	1998	258
2	60	3	1366	312	2	28	76
3	55	2	23105	19	2	135	13

Post-Neo CEA	RECIST Response	Adjuvant Treatment	Follow Up (Years)	Last Calcitonin	Last CEA	Alive
258	55.1%	Yes	3.5	694	68	Yes
76	32.2%	No	1.5	603	69	Yes
13	30.8%	No	0.8	135	13	Yes

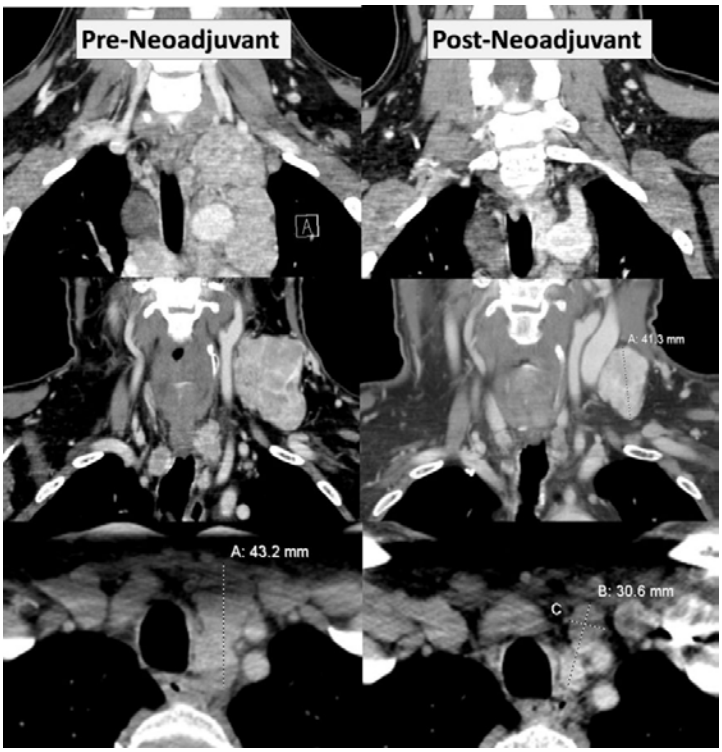

Figure 1. CT Neck Pre- and Post-Neoadjuvant Selective RET Inhibitor

A024: SHARED DECISION-MAKING IN THE MANAGEMENT OF INDETERMINATE THYROID NODULES

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Objective: The management of indeterminate thyroid nodules can be challenging and may include repeat biopsy, serial observation, or diagnostic thyroidectomy. Shared decision-making (SDM) integrates patient preferences and values with medical expertise in scenarios of clinical equipoise, potentially reducing decisional conflict and improving patient satisfaction and outcomes. This study investigates the SDM practices of patients and physicians during the management of indeterminate thyroid nodules and the association of SDM with patient perceived decisional conflict.

Methods: This study was a single institution, cross-sectional, multiple methods study of patients presenting to the Head & Neck Surgical Oncology service with indeterminate (Bethesda-III and Bethesda-IV) thyroid nodules from October 2020 to August 2021. Patient and physician self-administered questionnaires, including the 9-item Shared Decision-Making Questionnaire (SDM-Q-9, SDM-Q-Doc) and the Decisional Conflict Scale (DCS) were utilized. DCS scores higher than 15 were considered clinically significant conflict. Consultations were video recorded. The Multifocal Approach to Sharing in Shared Decision-Making (MAPPIN'SDM) instrument was used to assess observer determined SDM involvement of the patient, physician, and patient-physician dyad. Spearman's rank correlation coefficients were obtained.

Results: In total, 31 patients and four surgeons participated in the study. Most patients were female (71%) with Bethesda-III nodules (90%). Many patients opted for diagnostic thyroidectomy (48%) or surveillance (42%) in lieu of repeat biopsy (10%) or molecular testing (0%). Patient perceived participation in the SDM process was high, with 55% of patients reporting a maximum score. However, observer assessed involvement of the patient (median MAPPIN'SDM score: 7, IQR: 3-9), physician (median: 15, IQR: 12-19), and patient-physician dyad (median: 15, IQR: 13-18) in the SDM process was low. Patients generally did not participate in the majority of observer assessed SDM qualities, while physicians displayed minimal involvement across most items. Patients and physicians performed particularly poorly in three specific areas: determining the preferred approach for information exchange, clarifying understanding of information, and confirming the viewpoint of the patient.

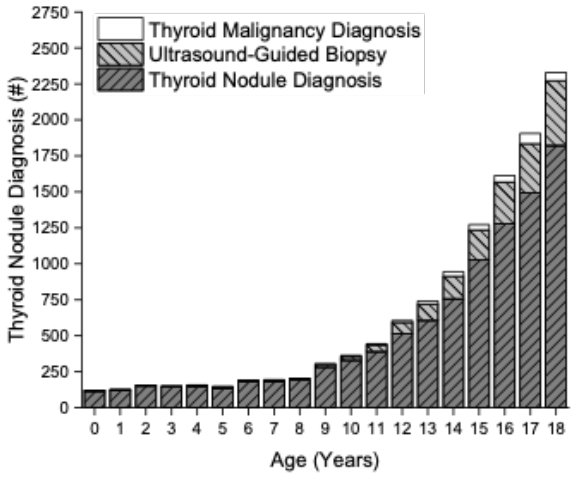
One fifth of patients reported experiencing clinically significant decisional conflict (median DCS score: 1.6, IQR: 0-10.9). There was no difference in decisional conflict between patient reported gender, education level, income, or attending surgeon. Higher patient perceived involvement in the SDM process was correlated with lower levels of decisional conflict ($r = -0.57$, $p < 0.001$), as was higher observed patient-physician dyad involvement ($r = 0.47$, $p < 0.01$).

Conclusion: Perceptions of SDM involvement were high amongst both patient and physicians. Yet, observations of SDM involvement was low. Ensuring patient and physician involvement in SDM during the management of indeterminate thyroid nodules may reduce decisional conflict. Future work will investigate the incongruency between observer and patient-physician perceived involvement in the SDM process, and how to improve specific aspects of SDM such as confirming the exchanged information has been understood.

POSTER LISTINGS

A025: HEALTH CARE DISPARITIES AND RATES OF MALIGNANCY AMONGST CHILDREN WITH SINGLE THYROID NODULES

Z. Jason Qian, MD[1]; Eric Pineda, BS[2]; Hilary Seeley, MD[1]; Gary Hartman, MD[1]; Julia Noel, MD[1]; Lisa A Orloff, MD[1]; Kara D Meister, MD[1]; [1]Stanford University; [2]Tulane University



Introduction: It has been long accepted that the rate of malignancy in pediatric thyroid nodules is higher (15-26%) than the reported rate in adults (5-10%). Furthermore, data suggest the overall incidence of thyroid cancer is increased in the pediatric population, especially in Hispanic patients. Because treatment recommendations, including timing of biopsy and need for thyroid surgery, are based on the assumption of a higher incidence of malignancy, reevaluating this incidence is important for future guidelines and clinical care. We additionally sought to identify any health care disparities which may exist in the care of children with thyroid nodules.

Methods: A retrospective analysis of insurance claims data was conducted using Optum's Clinformatics® Data Mart Database (OptumInsight, Eden Prairie, Minnesota) from January 1, 2003 to June 6, 2020. This source contains de-identified claims data from a commercial insurer. We included patients based on CPT and ICD codes. Sociodemographic information including age at diagnosis was obtained from the database.

Statistical analyses were performed using Stata 16 (StataCorp LP, College Station, Texas). Descriptive statistics were used to report incidence of thyroid neoplasm among children with single thyroid nodules. Multiple logistic and linear regressions were used to identify demographic variables that were associated with thyroid healthcare outcomes. Effect sizes were respectively reported as adjusted odds ratios (OR) and mean differences (MD) with 95% confidence intervals (CI).

Results: In total, 11,643 children were diagnosed with single thyroid nodules and 2,117 (18.2%) received a biopsy. Among patients who received biopsy, 304 (14.4%) had concurrent or subsequent diagnoses of thyroid malignancy (Figure 1).

Older age at nodule diagnosis was associated with increased odds of receiving a biopsy (OR, 1.11; 95% CI 1.09, 1.13), as was female sex (OR, 1.25; 95% CI 1.11, 1.40). Compared to White race/ethnicity, Black (OR, 0.80, 95% CI 0.65, 0.99) and Hispanic (OR, 0.84; 95% CI 0.72, 0.99) race/ethnicity was associated with lower odds of receiving a biopsy.

Amongst children who underwent biopsies, the median time between initial thyroid nodule diagnosis and biopsy was 29 days (IQR 4 to 229). Parental education ≥Bachelor's level was associated with a significantly shorter interval by one week (MD, -7.24 days; 95% CI -13.75, -0.73).

Females did not have significantly different odds of having a thyroid malignancy than males (OR, 1.08; 95% CI 0.80, 1.47). Additionally, age at nodule diagnosis and race/ethnicity did not predict odds of thyroid malignancy.

Discussion: These data suggest that the incidence of malignancy in children with a single thyroid nodule who undergo FNA is similar to that previously reported. However, there exists a large cohort of patients with a diagnosis of thyroid nodule who do not undergo FNA. Black and Hispanic patients are less likely to receive a biopsy than White patients, which may represent a diagnostic disparity relating to previous publications reporting larger tumor size at diagnosis of thyroid cancer in minority children.

Figure 1: Proportion of children who received thyroid nodule diagnosis, ultrasound-guided biopsy, and thyroid malignancy diagnosis by age.

A026: COMPARISON OF RISK FACTORS AND POSTOPERATIVE OUTCOMES IN PRIMARY AND SECONDARY/TERTIARY HYPERPARATHYROIDISM

Ryan M Kong, BS; Jennifer Liang, MD; Natalya Chernichenko, MD; SUNY Downstate Health Sciences University

Objective: (1) To analyze and compare the rate of risk factors and postoperative adverse events (AE) between primary and secondary/tertiary hyperparathyroidism (HPT). (2) To compare demographic risk factors and postoperative AE between same day discharge versus overnight admission groups within the primary HPT population. (3) To elucidate the predictive value of the modified 5-item frailty index score (mFI-5) on postoperative AE within secondary/tertiary HPT population.

Study Design: Retrospective cohort study

Setting: American College of Surgeons National Surgical Quality Improvement Program database analysis from 2005 to 2017

Methods: Patients with primary/secondary/tertiary HPT undergoing parathyroidectomy (n=26,895) were identified. They were then stratified into respective primary versus secondary/tertiary groups as well as same day discharge versus overnight admission groups. Demographic, intraoperative, and postoperative AE was analyzed between the groups utilizing univariate analysis and multivariate logistic regression models controlling for age, sex, and estimated probability of morbidity. Postoperative AE included postoperative complications (POC), reoperation, readmission, and in-hospital mortality.

Results: Secondary/tertiary HPT patients compared to primary were significantly more likely to have partially dependent functional status, ASA of 3 or 4, lower mean BMI, higher mean age, comorbidities prior to surgery, be male, and be African American (AA) (all, $p<0.05$). Secondary/tertiary HPT patients also had higher mean length of stay (4.8 days vs 0.8 day; $p<0.001$). Secondary/tertiary HPT had higher risk of POC (wound, pulmonary,

renal, neurological, cardiac, and sepsis-related), reoperation, readmission, and mortality (all, p<0.05) **Table 1**. Within primary HPT, patients that had an overnight admission were significantly more likely to have partially or totally dependent functional status, ASA of 3 or 4, higher mean BMI, higher mean age, comorbidities prior to surgery, and be AA (all, p<0.05). Overnight admission was found to be a predictive risk factor of developing postoperative AE such as POC (wound, pulmonary, renal, cardiac, sepsis-related), readmission, or reoperation (all, p<0.05) **Table 2**. Within secondary/tertiary HPT, risk of postoperative AE was found to increase with increasing mFI-5 (p<0.001).

Conclusion: Secondary/tertiary HPT compared to primary had higher rates of preoperative comorbidities, partially dependent function status, ASA 3 or 4, and higher risk of postoperative AE. Within primary HPT, patients that had an overnight admission compared to same day discharge had higher rates of preoperative comorbidities, partially/totally dependent function status, ASA 3 or 4, and higher risk of postoperative AE. mFI-5 is a predictive measure of postoperative AE within the secondary/tertiary HPT population.

Postoperative Outcomes	OR (95% CI)	P-Value
Adverse Events	2.8 (2.4 - 3.4)	<0.001
Postoperative Complications	3.4 (2.6 - 4.5)	<0.001
Wound Complications	2.4 (1.4 - 4.1)	<0.001
Pulmonary Complications	7.5 (3.9 - 14.6)	<0.001
Renal Complications	2.9 (1.9 - 4.4)	<0.001
Neuro Complications	1.1 (0.3 - 3.3)	0.916
Cardiac Complications	4.3 (1.9 - 9.7)	<0.001
Sepsis-Related Complications	11.6 (3.5 - 37.7)	<0.001
Readmission	2.5 (1.9 - 3.2)	<0.001
Reoperation	2.5 (1.8 - 3.3)	<0.001
Mortality (In-hospitalization)	2.4 (0.9 - 6.8)	0.091

Table 2: Risk of postoperative AE between overnight admission compared to same day discharge within the primary HPT population undergoing parathyroidectomy.

Postoperative Outcomes	OR (95% CI)	P-Value
Adverse Events	2.8 (2.4 - 3.4)	<0.001
Postoperative Complications	3.4 (2.6 - 4.5)	<0.001
Wound Complications	2.4 (1.4 - 4.1)	<0.001
Pulmonary Complications	7.5 (3.9 - 14.6)	<0.001
Renal Complications	2.9 (1.9 - 4.4)	<0.001
Neuro Complications	1.1 (0.3 - 3.3)	0.916
Cardiac Complications	4.3 (1.9 - 9.7)	<0.001
Sepsis-Related Complications	11.6 (3.5 - 37.7)	<0.001
Readmission	2.5 (1.9 - 3.2)	<0.001
Reoperation	2.5 (1.8 - 3.3)	<0.001
Mortality (In-hospitalization)	2.4 (0.9 - 6.8)	0.091

Table 2: Risk of postoperative AE between overnight admission compared to same day discharge within the primary HPT population undergoing parathyroidectomy.

A027: FACTORS ASSOCIATED WITH REFUSAL OF SURGERY IN DIFFERENTIATED THYROID CARCINOMA

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Importance: The primary management of differentiated thyroid carcinomas (DTC) is most often surgical intervention. In some instances, patients may opt not to receive surgery for a variety of reasons, which could affect clinical outcomes.

Objectives: To investigate factors associated with refusal of recommended surgery in patients with DTC and the association of refusal with overall survival.

Design, Setting, and Participants: A retrospective cohort study of patients in the National Cancer Database (NCDB) diagnosed with non-metastatic DTC between January 2004 and December 2016.

Main Outcomes and Measures: Patients were classified as "operable and resected" if they received recommended surgery at the primary site and were classified as "operable and unresected" if they refused recommended surgery. Main outcomes of the study were overall survival and the odds of refusing surgery based on demographic, socioeconomic, and clinical factors. Analysis was conducted using multivariable logistic regression and multivariable Cox proportional hazards model.

Results: A total of 148,547 patients (mean age, 47.9 years; 32,978 (22.2%) male) were included in the final analysis. Most patients had papillary histology (141,063, 95.0%), followed by follicular histology, and 247 (0.2%) opted out of recommended surgery. On multivariable analysis, patients aged 74-100 were more likely to refuse surgery compared to patients aged less than 54 (OR 6.70, CI [3.95-11.39]). Black patients and Asian patients were also more likely to refuse surgery compared to White patients (OR 3.12, CI [2.04-4.78]; OR 2.49, CI [1.53-4.08], respectively). Individuals without insurance opted out of surgery more often than those with private insurance (OR 5.28, CI [3.05-9.14]), and larger tumor size (clinical stage T4) was associated with increased likelihood of treatment refusal (OR 3.99, CI [2.35-6.75] vs T1). By contrast, income greater than $63,000 (OR 0.52, CI [0.30-0.93] vs income less than $38,000) and treatment at a single facility (OR 0.04, CI [0.03-0.06] vs treatment at multiple facilities) were associated with lower odds of surgical refusal. Lastly, refusal of surgery was associated with decreased overall survival compared to receipt of surgery (HR 1.95, CI [1.42-2.68]).

Conclusions and Relevance: Patient refusal of recommended surgery for treatment of DTC is rare but is associated with a variety of disease and socioeconomic factors. Refusal of surgery is also associated with increased overall mortality. Our data may help physicians identify those more likely to refuse surgery and offer counseling regarding its potential implications on overall survival.

A028: IMPACT OF NODAL STAGING ON TREATMENT AND SURVIVAL IN MEDULLARY THYROID CANCER

Ryan Jin, BS; Christopher Didzbalis, BS; Kirolos Georges, BA; Salma Ahsanuddin, BS; Richard Chan Woo Park, MD; Department of Otolaryngology-Head & Neck Surgery, Rutgers New Jersey Medical School, Newark, New Jersey, USA

Objectives: Medullary thyroid cancer (MTC) comprises 5-10% of all thyroid cancers. The current treatment paradigm consists of surgical resection of the thyroid gland and neck dissection of central lymph nodes, with consideration of lateral neck dissections in select cases. We assess the clinicopathologic features, treatment modalities, and associated survival for patients with isolated central neck disease versus lateral neck disease in MTC.

Methods: The 2010-2016 National Cancer Database was queried for T1-T4 MTC. Cases were stratified based on pathologic nodal staging: pN0, pN1a, and pN1b. Demographic, clinicopathologic factors, and treatment regimens were compared between all three groups. Kaplan-Meier and Cox multivariable survival analyses were

performed to determine differences in outcomes between the groups.

Results: 3257 cases of MTC were analyzed, of which 1901 (58.4%) were pN0, 464 (14.3%) were pN1a, and 892 (27.4%) were pN1b. Surgery in combination with radiation or chemotherapy was more frequent in pN1b disease (32.9%) compared to pN1a (20.5%) and pN0 (16.1%). Females, white patients, and patients under 65 comprised a significantly larger portion of the cohort (70.1%, 85.9%, and 72.6%, respectively). Female patients were significantly less likely than male patients to present with pN1b disease (OR 0.46, 95% CI 0.35 – 0.59, p<0.001). 28 patients experienced extracapsular spread, of which 92.9% had pN1b disease (p=0.003). Patients with pN1b were also significantly more likely to have advanced T staging as compared to pN0 and pN1a and more likely to undergo combination surgery and radiation as well as combination surgery and chemotherapy (p<0.001). Immunotherapy administration was limited to 7 cases, of which 57.1% were given for pN1b disease (p=0.254). Patients with pN1b disease experienced the poorest 10Y overall survival (OS) of 49.3%, while patients with pN0 and pN1a had 10Y-OS of 83.8% and 69.4%, respectively. On Cox multivariable survival analysis, pN1b status (HR 2.51, 95% CI 1.91 – 3.30, p<0.001) was associated with increased mortality.

Conclusions: MTC with lateral neck disease based on pathological N stage was associated with advanced T stage and poorer overall survival with a significantly higher hazard of death as compared to patients with central neck disease. Patients with lateral neck disease were also more likely to undergo combination therapy with surgery and radiation or chemotherapy. Further studies investigating the association between clinicopathologic characteristics of lateral neck disease and patient outcomes are warranted.

A029: IMPLICATIONS OF EMERGENCY DEPARTMENT PRESENTATION FOR HEAD AND NECK CANCER SURGERY

Alizabeth K Weber, MD; James A Gallogly, MD; Jennifer V Brinkmeier, MD; Sean T Massa, MD, MSCI; Saint Louis University School of Medicine

BACKGROUND: Patients with head and neck cancer (HNC) may present for care through the emergency department either due to lacking other access to care or the severity of their symptoms. The frequency of this occurrence and its implications have not previously been assessed for HNC in a large dataset.

METHODS: A retrospective cohort of adults with a HNC diagnosis admitted for ablative HNC surgery was generated from the New York State Inpatient Database (NY SID) from 2006 - 2016. Each individual's first admission was captured. Those with distant metastatic disease were excluded. Associations between admission through the Emergency Department (ED) with length of stay (LOS) and total charges were assessed using multivariable, hierarchical models with appropriate transformations to meet the modelling assumptions to account for differences in individual and hospital characteristics. Secondarily, differences in inpatient mortality based on ED admission were assessed using univariable and multivariable methods.

RESULTS: The cohort included 12,920 individuals. Demographic and clinic factors correlated with ED admission by odds ratio (OR, 95% confidence interval [CI]) were age 80 or greater (1.61, 1.24-2.10), male sex (1.49, 1.29-1.72), Black race (4.22, 3.55-5.02), Hispanic race (2.75, 2.25-3.38), unknown/other race (1.66, 1.39-1.98), Medicaid/self pay (3.40, 2.96-3.91), other payer (1.91, 1.23-2.96), emergency admission (363, 266-496), and non-academic hospital status (1.72, 1.43-2.06). ED admission was associated with longer overall LOS and postoperative LOS with average differences of 11 days (CI 10.3-11.7) and 6 days (CI 5.3-6.7), respectively. Mean total index admission charge was greater for ED admissions ($43,197) versus non-ED admissions ($19,010), with mean difference of $24,191 (CI 20,713-27,669). Survival analysis demonstrated lower survival associated with ED admission (Figure 1). Multivariate regression modeling was performed to evaluate associations with LOS and total charges. After controlling for covariates, admission to the ED was associated with 81.6% (CI 76.8-86.5) and 80.4% (CI 70.5-90.8) increase in length of stay and charges, respectively, as well as decreased survival with a hazard ratio of 1.97 (CI 1.60-2.42). The proportion of ED admissions among HNC patients increased by over the 10 years studied.

DISCUSSION: Rates of ED admission for HNC diagnoses requiring surgical intervention during index admission are rising. Our findings demonstrate that patients who initially present for HNC surgery through the ED have longer LOS, higher cost of admission, more postoperative complications and increased inpatient mortality. This could in part be explained by disadvantaged patients presenting later with more severe disease and worse comorbidities. However, these effects persist after controlling for comorbidities. Longer LOS could arise from difficulties in discharge planning in patients with limited resources and reduced insurance coverage.

CONCLUSION: The increasing frequency of ED admission prior to HNC surgery and its association with inferior outcomes demands more attention to this route of accessing care.

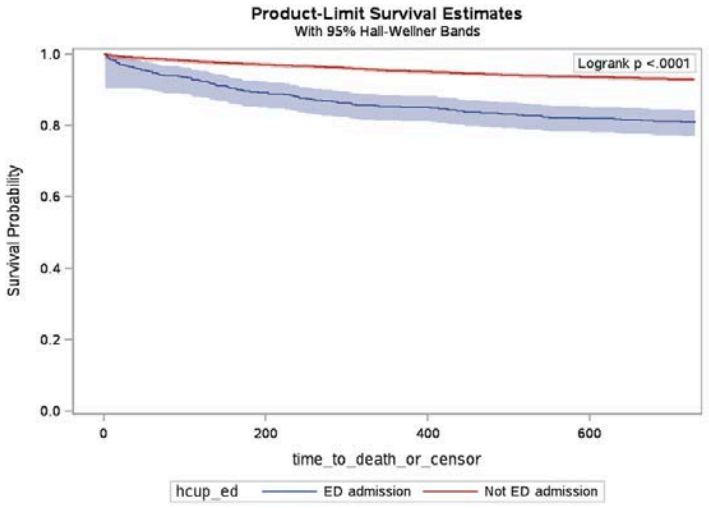

FIGURE 1. Overall Survival by Admission Route.

A030: ASSESSING THE NUTRITIONAL RISK INDEX AS A PREDICTOR OF POSTOPERATIVE COMPLICATIONS IN HEAD AND NECK CANCER SURGERY

Rushi Patel, BA; Vraj P Shah, BS; Prayag Patel, MD; Jean A Eloy, MD, FACS, FARS; Rutgers New Jersey Medical School

Objectives: Malnutrition is a significant concern for patients with head and neck cancer (HNC) and is associated with poor outcomes. The Nutritional Risk Index (NRI) assesses

malnourishment and has been shown to identify patients at risk for postoperative complications in different surgical fields. Our aim is to determine the utility of the NRI in predicting postoperative outcomes for patients undergoing head and neck cancer surgery using a national database.

Study Design: Retrospective database review

Methods: We queried the 2012-2018 National Surgical Quality Improvement Program (NSQIP) database for all patients undergoing oral cavity (OC), pharyngeal, or laryngeal cancer surgery. We excluded cases with missing height, weight, albumin levels, and patients undergoing free tissue transfer. The NRI score was calculated for each patient, and patients were subdivided into malnourished and nourished depending on their nutritional status. We conducted univariate and multivariate analyses.

Results: A total of 3,698 patients met inclusion criteria with 350 (9.5%) having NRI-defined malnutrition. Of these patients, 2,763 (74.7%) of cases received surgery for an OC malignancy while 596 (16.1%) and 546 (14.8%) had pharyngeal and laryngeal surgery, respectively. Patients were predominately less than 65 years (57.4%), male (63.2%), and white (76.9%). Malnourished patients with cancer of the OC, pharynx, and larynx had longer lengths of stay (8.0 vs. 3.2 days, 12.2 vs. 5.4, and 16.8 vs. 12.4, respectively; p<0.001 for all). Similarly, malnourished patients had longer operative times for OC (252.5 vs. 171.3 min; p<0.001), pharynx (370.06 vs. 267.2 min; p<0.001), and larynx (411.6; vs. 358.9 min; p=0.004) subsites. Accounting for demographic and comorbid conditions, multivariate regression analysis revealed no significant association between NRI-defined malnourishment and all complications (OR=1.37 [0.58-3.24], p=0.475), medical complications (OR=0.63 [0.19-2.15], p=0.459), or surgical complications (OR=2.37 [0.93-6.06], p=0.072) for the HNC cohort. On individual subsite analysis, we found similar trends for patients with OC surgery. However, for patients receiving pharyngeal surgery, we found a significant relationship for all (OR=2.25 [1.17-4.33], p=0.016) and surgical (OR=2.63 [1.28-5.39], p=0.008) complications. NRI-defined malnourishment also was significantly associated with all (OR=1.81 [1.09-3.00], p=0.022) and surgical (OR=2.09 [1.23-3.56], p=0.007) complications in laryngectomy patients.

Conclusion: Patients with NRI-defined malnourishment tend to have longer operative times and length of stays. We also find malnourished patients to be at an increased risk for all complications and surgical complications in pharyngeal and laryngeal but not in oral cavity cancer surgery. The NRI can be a useful clinical tool to help identify high risk patients in select cohorts.

A031: OPIOID PRESCRIBING PATTERNS ACROSS HEAD AND NECK CANCER ONCOLOGY TEAMS AND OTOLARYNGOLOGY PROVIDERS

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Background: Opioid-related deaths and abuse have garnered national attention and progressive reform in prescriber options over the last decade. Increased prescription surveillance and provider restrictions were employed to reduce mortality. Nonetheless, narcotics remain a staple in the management of acute and chronic cancer-related pain. In the head and neck cancer population, substance abuse is a known contributor to cancer etiology and treatment morbidity, further complicating routine opioid prescribing in this population. We aim to characterize opioid prescribing patterns across head and neck cancer providers to assess for strategic areas of education and intervention in this complex cancer cohort.

Methods: This is a retrospective cohort study of 214 patients treated surgically and non-surgically with head and neck cancer at tertiary and quaternary care regional hospitals in Louisiana (2011-2019), all served by one academic otolaryngology (ENT) department. Charts were reviewed for demographic information, tumor pathology and staging, and treatment modality. Patients' opioid prescribing patterns between providers (otolaryngology and non-otolaryngology, as well as resident and faculty clinics) were logged. Opioid use data was obtained from the Louisiana Prescription Monitoring Database and recorded in morphine milligram equivalents (MME) per day.

Results: Several trends in opioid prescribing and usage were noted across faculty-run and resident-run head and neck clinic providers. In the first month after biopsy-proven diagnosis, the most common prescriber was an otolaryngologist (60%). At the third month, this shifted to the radiation oncologist (44%). After 6 months, there is a shift back toward ltolaryngology-driven pain management. There was no significant difference in opioid usage across tumor stage, gender, primary tumor site or history of chronic pain. Resident providers were more likely to see advanced stage lesions (p<0.001) and treat patients dispositioned to non-surgical management versus primary surgery (p<0.001). Primary surgery patients were more likely to receive an opioid from an ENT versus non-surgical patients (p=0.02). Residents were also more likely to prescribe an opioid in case-matched patients when compared to faculty (p<0.001). The odds of being prescribed opioids decreases from time of diagnosis over the length of treatment (p=0.00013), but also decreases significantly less quickly for resident providers (p=0.0011). Those treated with primary surgery are prescribed fewer MME (across all providers) than those treated non-surgically at the start of therapy (p<0.0001), but this steadily increases significantly (p=0.0001) over time. Over time (>12 mo after diagnosis) in those treated with primary surgery, MMEs tend to decrease (p<0.0001), but the rate is slower for resident provider patients than faculty provider patients (p=0.0124). Residents prescribe less MMEs (p=0.016) for non-surgery patients than faculty, but this effect doesn't hold up for surgery patients (p=0.04).

Conclusion: There are currently no guidelines for prescribing opioids in the head and neck cancer setting. We identified trends in opioid prescribing and usage in our patient population centered in an academic setting. In particular, the variance in opioid prescribing across provider type (ENT versus non-ENT) and resident versus faculty was outlined. Further work aimed at targeting education to prescribers and optimizing pain control is warranted.

A032: APPLICATION OF FIBRIN SEALANT TO THE TRANSORAL SURGICAL DEFECT SIGNIFICANTLY REDUCES OPIOID USE AND POSTOPERATIVE PAIN

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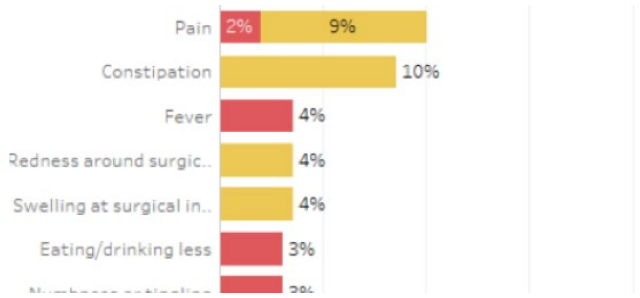
Objective: Transoral surgeries, such as those to treat oral and oropharyngeal cancers, frequently lead to a painful, protracted postoperative course. The pain can adversely impact patients' recovery, causing in delays in the resumption of adequate oral intake, initiation of adjuvant treatment, and prolonging hospitalization. Dependence on opioid analgesia to avert this is a common occurrence. The application of fibrin sealant to the surgical defect at the time of transoral surgery may provide a solution to improve pain and reduce opioid utilization in the postoperative setting. This is the first study to evaluate the role of fibrin sealant as a non-opioid postoperative analgesic option in transoral surgery.

Methods: This is a retrospective review of a cohort of head and neck surgical patients who underwent transoral surgery in the oral cavity or oropharynx from 2018-2021. Patients with topical application of fibrin sealant to the operative defect were compared to a control group for whom fibrin sealant was not applied. Postoperative pain (Standard Pain Scale 0-10) was assessed at postoperative days (POD) 1, 2, and 3, at week 1–3, and at month 2-3. The need for opioid analgesia, duration of opioid use, and time to re-initiation of baseline oral intake were also measured.

Results: A total of 58 patients met eligibility criteria (fibrin sealant, n=20; control, n=38). 55% of the fibrin sealant cohort had a cancer diagnosis (vs. 42% in controls) and mean tumor size was 2.48cm. 97.4% of controls required the use of postoperative opioid analgesia, whereas only 33.3% of patients in the fibrin sealant cohort required any opioid analgesia. Mean Standard Pain Scale score was consistently lower in the fibrin sealant cohort on POD 1 [Mean=2.55 (SD 2.73) vs. 3.37 (SD 2.63) in controls], POD 2 [2.67 (SD 2.16) vs. 3.00 (SD 1.70)], and POD 3 [2.67 (SD 2.52) vs. 3.20 (SD 3.83)]. At postoperative week 1-3, the fibrin sealant cohort demonstrated a lower pain score versus control [Mean=3.25 (SD 3.86) vs. 6.50 (SD 3.54)], and all had resumed preoperative baseline oral intake. Hospital length of stay was similar between groups with 90% of the fibrin group discharged by postoperative day one versus 86.8% in the control group.

Conclusions: Reduced opioid burden and early resumption of oral intake after transoral surgery can avert opioid dependence and delays in initiating adjuvant treatment, while improving nutritional status and quality of life measures. This study is the first to evaluate the role of fibrin sealant in the mitigation of postoperative pain after transoral surgery. Application of fibrin sealant to the transoral surgical defect significantly reduced the need for opioid analgesia in the postoperative period and correlated to a significant decrease in the need for opioids at time of discharge versus controls. Our findings demonstrate promising trends favoring the use of fibrin sealant as a non-opioid analgesic agent after transoral surgery. While the results of this study are encouraging, further investigation is warranted.

Figure: Symptom Alerts Across Users



View of fibrin sealant applied to left transoral robotic radical tonsillectomy surgical defect.

A033: SURVIVAL IMPROVEMENT IN LOW-INCOME PATIENTS WITH ORAL CAVITY CARCINOMA: A HOSPITAL BASED STUDY

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Background: Historically, low-income patients with oral cancer exhibit worse oncologic outcomes compared to high-income patients.

Objective: To determine if the disparity between low and high-income patients with oral cancer has changed over time and to evaluate factors associated with these changes.

Methods: Patients from the National Cancer Database (NCDB) with oral cavity squamous cell carcinoma and a recorded clinical stage were analyzed. An "early group" defined as 2004 and 2005 was compared to a "late group" defined as 2010 and 2011, to allow at least 5 years' worth of survival data. The lowest-income group (zip code median income < $30,000/yr) was compared to the highest-income group (zip code median income >/= $46,000/yr). The primary outcome was median overall survival (OS) by Kaplan Meier analysis using log-rank testing with $p<0.05$ for significance. Secondary analyses were performed to reveal associated trends.

Results: A total of 11,685 patients were selected. Mean age was 64 years. Patients were predominantly male (61%), white (85%), and privately insured (68%). Internal validity of the dataset was performed analyzing median OS by stage. Median OS (95% CI; months) for stage I-IV patients was 112 (104-118), 69 (63-74), 39 (33-46), and 20 (18-21) months, respectively ($p<0.001$).

Median OS in the lowest-income group rose from 38 (33-44) months in years 2004/2005 to 47 (42-52) months ($p=0.046$) by 2010/2011, but did not change in the highest-income group [72 (69-76) from 70 (65-75) months; $p=0.61$].

Factors associated with improved OS in the low-income group were then investigated. Over the study period, there was a significant improvement in the proportion of low-income patients presenting with early-stage disease (46.1% up to 50.4%, $p=0.016$ by chi-squared). More low-income patients received oncologic surgery as opposed to local excisions or tumor destructions

(49.0% to 59.2%; p<0.001) and had negative margins on final pathology over time (52.4% to 62.8%; p<0.001). In addition, over the study period more low-income patients received neck dissections (35.4% to 47.3%; p<0.001), neck dissections with >18 lymph nodes (25.0% to 34.7%; p<0.001), and received treatment at academic centers over time (52.1% to 56.0%; p=0.030).

Fewer low-income patients received radiation (43.4% down from 48.5%; p=0.013). There was no difference in low-income patients receiving chemotherapy, treatment delay > 46 days or 60 days, days to adjuvant radiation, incidence of post-operative radiation delay (p>0.05).

Conclusion: There has been a measurable increase in median overall survival for low-income patients with oral cavity squamous cell carcinoma, correlating with earlier diagnosis and improved surgical indicators of quality.

A035: IMPACT OF PREOPERATIVE CARE ON CLINICAL OUTCOMES AFTER TOTAL LARYNGECTOMY

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Introduction: Patients undergoing total laryngectomy (TL) often have significant comorbidities which can complicate anesthesia and surgery. Furthermore, patient factors such as nutrition status and functional status affect recovery after surgery. TLs are life changing surgeries which consume significant hospital resources, and it is important to pre-operatively optimize patients for surgery to most effectively use limited medical resources. Pre-operative care can yield high value and patient centered care by systematically addressing individual risk as well as identifying areas to mitigate surgical risk.

Methods: This was a retrospective study of all patients who underwent TL between 2013 and 2019 at a single tertiary care academic institution. Patients who received perioperative care were compared with patients who did not. Outcomes included length of hospital stay, 90-day readmission, post-surgical complications, and overall survival.

Results: There were 263 TL patients, of which 154 received perioperative care and 109 received the standard of care. The cohort was predominately male (77.2%), and the rest were female. The vast majority of patients were White (90.1%), followed by Black (8.4%), and other (1.5%). Mean age at time of surgery was 62.5 years (Standard Deviation [SD] 9.9). Demographics were not statistically different between treatment groups. Length of hospital stay was significantly shorter for those who received perioperative care (median 9, Interquartile Range [IQR] 6) versus standard of care (median 10, IQR 8; p=0.03). Rate of post-surgical complications was not significantly different between perioperative care and standard of care patients (38.3% and 39.4% respectively; p=.898). Readmission within 90 days was the same for perioperative care (42.2%) versus standard of care (36.4%, p=0.40). There was no difference in survival (p=.481).

Conclusions: Our findings show that patients who participated in perioperative care had a significantly shorter hospital stay compared with patients who received standard care. However, there was no difference in 90 day readmission, post-surgical complications, or overall survival. Our study shows that perioperative care clinics may reduce cost to the healthcare system and relieve the burden of prolonged hospital stays for patients and their family members.

A037: MENTAL HEALTH AND QUALITY OF LIFE IN HEAD AND NECK CANCER SURVIVORSHIP

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Background: Head and neck cancer is associated with an increased prevalence of mental health disorders (MHDs) and suicide risk relative to the general population. However, there is a paucity of data on the relationship between MHDs and quality of life in head and neck cancer survivorship.

Objective: To examine the association of MHDs with health-related quality of life (HRQOL) in a hospital-based cohort of head and neck cancer survivors.

Methods: Data from patients with head and neck squamous cell carcinoma (n=198) were obtained from the UNC Health Registry/Cancer Survivorship Cohort, a retrospective, hospital-based cancer cohort, who provided myriad patient-reported outcomes. MHD was defined as positive patient response to "have you ever been told by a doctor or other health care professional that you have Depression or Anxiety". HRQOL was measured using general (PROMIS) and cancer-specific (FACT-GP) validated patient-reported questionnaires. Linear regression models and Kaplan-Meier curves with log rank p-values were used to examine the association of MHDs with HRQOL, 5-year overall survival (OS), and 5-year cancer specific survival (CSS).

Results: Most patients were male (82%) and had advanced stage (III/IV) disease (70.1%). Forty-two patients (21.2%) self-reported a prior diagnosis of anxiety or depression. Female sex (OR 3.78, 95% CI 1.72 to 8.30; p=0.001), unmarried status (OR 2.05, 95% CI 1.01 to 4.16; p=0.049), and Medicare insurance (OR 2.69, 95% 1.28 to 5.64; p=0.009) were significant predictors of having an MHD diagnosis. Patients with MHD had significantly worse physical (mean difference -5.3, 95% CI -8.2 to -2.3; p<0.001) and mental health (mean difference -7.0, 95% CI -9.9 to -4.1; p<0.001) on general HRQOL questionnaires and worse physical (mean difference -2.4, 95% CI -4.1 to -0.7; p=0.005) and emotional health (mean difference -3.5, 95% CI -5.0 to -2.0; p<0.001) on the cancer specific HRQOL questionnaires. The associations of MDH with HRQOL outcomes persisted in a sensitivity analysis limited to patients completing the questionnaire at least 6 months after cancer diagnosis. MHD was not predictive of 5-year OS (p=0.087) or 5-year CSS (p=0.565).

Conclusions and Relevance: Mental health disorders affected at least one-fifth of a retrospective, hospital-based cohort of head and neck cancer survivors and were associated with significantly worse patient-reported quality of life outcomes. Early identification and intervention of MHDs may help improve patient outcomes in head and neck cancer.

A038: PSYCHOLOGICAL ADJUSTMENT TO ACTIVE SURVEILLANCE VERSUS IMMEDIATE SURGERY FOR LOW-RISK PAPILLARY THYROID CANCER: A PILOT STUDY

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Introduction: The incidence of thyroid cancer has increased dramatically in the United States over the past several decades. This is partially attributable to more frequent screening ultrasonography with diagnosis of very small, low-risk papillary thyroid carcinomas on biopsy. These low-risk malignancies may be effectively treated either with surgery or active surveillance, as adopted by the ATA clinical practice guidelines in 2015. However, the psychological adjustment to these initial treatment approaches has not been studied extensively. In this pilot study, we aim to compare the psychological impact and quality of life among patients undergoing active surveillance versus upfront surgery for treatment of low-risk papillary thyroid cancer.

Methods: This is a multicenter prospective study at two tertiary referral hospitals. We collected self-reported psychological data among a group of patients with low-risk papillary thyroid cancer (LR-PTC) treated with either active surveillance or upfront surgery. LR-PTC was determined by FNA cytology (Bethesda VI or V) and/or ATA ultrasonographic criteria, and included a maximum diameter of ≤ 1.5 cm. An assessment was performed at the time of initial treatment and again at 6 and 12 months. The assessment included a 164-item questionnaire, which drew from 10 previously validated psychological and quality of life assessment tools. Patients were queried about the impact of thyroid cancer on daily life, thoughts and feelings regarding treatment decision, and physical and psychological well-being.

Results: Twenty-seven patients with low-risk papillary thyroid carcinoma were included in the study. Eighteen patients (mean age = 57 years, range: 25 to 84 years) chose active surveillance and seven patients (mean age = 41 years, range: 25 to 54 years) chose upfront surgery; two patients were lost to follow up. Among 27 participants who completed baseline quality of life surveys, 25 completed at least one follow up survey, and 23 completed both the 6- and 12-month follow up surveys. Surveys were completed online, over the phone, or in written form. No patients undergoing active surveillance converted to surgical treatment during the study period. Compared to patients who underwent surgery, patients undergoing active surveillance were older ($p = 0.028$) and reported greater levels of depression ($p = 0.010$) on follow up, though both groups were in the minimal range for depressive symptoms overall. No significant difference was found between the groups' reported levels of worry ($p = 0.14$) and perceived intrusiveness of illness/treatment on life ($p = 0.31$).

Conclusion: This study demonstrates the impact of active surveillance versus upfront surgery on quality of life and psychological well-being in patients with low-risk papillary thyroid carcinoma. While either modality offers acceptable oncologic outcomes, the psychological influence of the initial treatment approach should be carefully considered when counseling these patients. The results of this study demonstrate a high level of compliance, and this study design may serve as a model for a more wide-scale evaluation across multiple institutions and extended over a longer follow up period.

A039: OUTCOMES OF THE FACELIFT INCISIONAL APPROACH IN NECK DISSECTION

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Background: The facelift incisional approach to neck dissection offers several advantages including improved cosmesis, increased patient satisfaction, and decreased morbidity, commensurate with a general trend in oncologic treatment towards reducing treatment morbidity and de-escalation of therapy. The facelift approach has been previously described using robotic or endoscopic instrumentation, but the clinical outcomes of this approach using standard instrumentation have not been reported. Herein we present a series of 35 facelift neck dissections with associated clinical outcomes and compare them to 78 standard neck dissections.

Methods: Retrospective review of a single surgeon's experience from January 2016 to December 2020, including 113 cases with 35 facelift incisional approaches. Subjects with insufficient clinical data or those who underwent neck dissection for thyroid cancer were excluded. Facelift approaches were performed using standard instrumentation without a robot nor endsocopy, occasionally requiring a Thompson or lighted retractor. Demographics, clinical course, and outcomes were collected and compared using appropriate statistical analyses.

Results: The mean age of the cohort was 60.1 ± 12.7 years and 72.6% were male. There were a lower proportion of males in the facelift group (57.1% vs 79.5%, $p=0.01$). 59 subjects (52.2%) had a significant smoking history, with no difference between groups ($p=0.18$). Mean follow up was 23.1 ± 19.1 months ($p=0.21$). There was an even distribution of clinical stages among the entire cohort (Stage I 19.5%, Stage II 25.7%, Stage III 19.5%, Stage IV 33.6%), and there was no significant difference in distribution of stages between groups ($p=0.21$). There was a trend towards patients with higher clinical and pathologic stages receiving a standard incision ($p=0.21$, $p=0.09$ respectively). Case duration was longer in the facelift group (598.3 ± 374.4 vs 460.3 ± 312.4 minutes, $p=0.001$), however this was not adjusted for other procedures performed concurrently with neck dissection. Only one bilateral neck dissection was performed using the facelift approach (2.9% vs 17.9%, $p=0.03$). Length of stay was shorter in the facelift group (2.1 ± 2.0 vs 4.7 ± 4.6 days, $p=0.002$). Mean positive node count was 1.6 ± 4.7 in the facelift group and 2.2 ± 3.5 in the standard group, and mean total node count was 31.5 ± 12.0 in the facelift group and 36.1 ± 20.8 in the standard group, with no significant difference between groups ($p=0.44$, $p=0.22$ respectively). 2 subjects (5.7%) in the facelift group had marginal mandibular weakness, one which ultimately resolved and the other which was due to intentional facial nerve sacrifice during parotidectomy, with no significant difference in incidence between groups ($p=0.67$). In the facelift group, one subject had an out of field nodal recurrence in the ipsilateral neck that was managed with surgery and post-operative radiation with no evidence of recurrent disease, and one subject had multiple recurrences in the contralateral neck. 34 subjects (97.1%) in the facelift group had no evidence of disease at study conclusion.

Conclusions: A facelift approach to neck dissection using standard instrumentation achieves acceptable clinical and oncologic outcomes compared to the standard incisional approach with an additional benefit of improved cosmesis.

POSTER LISTINGS

A040: ORAL TOXICITIES ASSOCIATED WITH IMMUNE CHECKPOINT INHIBITORS: A META ANALYSIS OF CLINICAL TRIALS

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Background: Emerging immune checkpoint inhibitors have shown remarkable promise in the treatment of various malignancies. Due to the novelty of these therapeutic agents, their oral toxicity profile is less well understood.

Objective: To investigate the incidence of oral mucositis (OM), stomatitis, xerostomia, osteoradionecrosis, dysgeusia, dysphagia, oral infections and other rare oral toxicities with immune checkpoint inhibitors.

Methods: Systematic electronic literature searches were conducted using Ovid MEDLINE, EMBASE, Cochrane Central Register of Controlled Trials, and clinictrials.gov. Two review authors retrieved studies using pre-determined eligibility criteria and conducted quality assessment and data extraction. Oral toxicity data, irrespective of toxicity grading, primary tumor or drug dosage, was extracted from study arms with administration of a single immunotherapy drug. Adverse events from combination therapies, including chemotherapy, radiation, stem cell transplantation and other immunotherapy agents were excluded. Fixed or random-effects meta-analysis models were used to summarize relative estimates for incidence of oral toxicities.

Results: This is an ongoing study. Based on preliminary results from clinicaltrials.gov data, a total of 20 clinical trials were identified, which reported immunotherapy associated oral toxicities. Nine studies reported OM with a weighted prevalence of 5% (95% CI: 2-8%). A higher OM prevalence (10%) was noted with CTLA-4 compared to PD-1 (6%) and PD-L1 (4 %) inhibitors. Twelve studies reported stomatitis as a separate entity and yielded a weighted prevalence of 3% (95% CI: 2-4%). PD-1 inhibitors showed a higher prevalence of stomatitis (6%) compared to CTLA-4 (2%) and PD-L1 (3%) inhibitors. Similarly, a higher proportion of individuals taking PD-1 inhibitors had xerostomia (11%) compared to CTLA-4 (2%) and PD-L1 (5%) inhibitors. The overall weighted pooled prevalence of xerostomia was estimated to be 5% (95% CI: 3-7%) based 10 clinical trials. Oral toxicity events, uncommon with conventional chemotherapy, including bullous pemphigoid, mucous membrane pemphigoid and lichenoid mucositis were noted.

Discussion: In addition to common oral toxicities, the widespread use of immunotherapy also revealed new oral mucosal barrier adverse events, for which the treatment options may be limited during the course of immunotherapy. The oral presentation is aimed at comprehensively reviewing the current evidence on oral immune-related adverse events with checkpoint inhibitors, including anti-PD-1, anti-PD-L1, and anti-CTLA-4 drugs.

A041: GASTROSTOMY TUBE PLACEMENT AND LONG-TERM QUALITY OF LIFE (QOL) OUTCOMES IN A POPULATION OF UNITED STATES VETERAN OROPHARYNX CANCER PATIENTS COMPARING TRANSORAL ROBOTIC SURGERY (TORS) AND NEOADJUVANT CHEMOTHERAPY AND RADIATION (CRT)

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Background: Swallowing outcomes after head and neck cancer treatment are innately tied to quality of life. These outcomes have been worse in the literature in the Veteran's Administration (VA) population.

Methods: We present our data comparing all oropharynx cancer patients seen in the multidisciplinary VA head and neck cancer clinic. We compare the incidence and duration of gastrostomy tube use in our TORS and CRT patients. The University of Michigan Head and Neck QOL questionnaire (HN-QOL) was used to evaluate long term quality of life outcomes.

Results: In 127 patients seen between January 2013 and June 2020, 22 (17.3%) underwent TORS and 105 (82.7%) CRT. Of the 127 total patients, 67 (52.8%) received a gastrostomy tube (G tube). Six (27.3%) TORS patients and 61 (58.1%) CRT patients had a G tube placed ($p = 0.008$).

At six months post treatment, incidence of G tube placement was 9.1% ($n = 2$) in TORS patients and 13.3% ($n = 14$) in CRT patients ($p = 0.586$). Incidence of G tube placement at 12 months was 4.5% ($n = 1$) in TORS and 5.7% ($n = 6$) in CRT patients ($p = 0.827$).

Median duration of G tube placement in the TORS and CRT groups were 179 and 133 days, respectively.

Mean overall HN-QOL scores for patients who had a G tube placed were 63.3 [95% CI 57.4, 69.3] at one to three months, 69.0 [95% CI 62.4, 75.7] at four to twelve months, and 73.6 [95% CI 68.5, 78.6] at more than eighteen months post-treatment. In patients who did not have a G tube placed, mean overall HN-QOL scores were 66.0 [95% CI 59.5, 72.6] at one to three months, 77.1 [95% CI 70.1, 84.1] at four to twelve months, and 74.9 [95% CI 69.3, 80.6] at more than eighteen months post-treatment. Mean pre-treatment overall HN-QOL scores were 70.4 [95% CI 62.2, 78.6] in the group who did and 76.3 [95% CI 69.2, 83.4] in the group who did not receive a G tube.

Conclusion: A higher percentage of our patients undergoing CRT had a G tube placed as compared to patients undergoing TORS. This could be related to an unquantified higher burden of disease in the CRT patients, though T stage was not significantly different between groups. Despite the CRT patients initially receiving more G Tubes, at six months and one year there was no difference in prevalence of G tubes in the two populations. Initial HN-QOL scores were poorer in patients who required a G tube, further emphasizing the importance of oral diet to our head and neck cancer patients. There were no differences between HN-QOL scores after 18 months between patients who did and did not receive a G Tube, showing a normalization of symptoms during the recovery process.

A043: PRIMARY FIT TRACHEOESOPHAGEAL PUNCTURE IN PRIMARY VERSUS SALVAGE LARYNGECTOMY: SHORT AND LONG-TERM COMPLICATIONS AND FUNCTIONAL OUTCOMES

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Background/Objective: Tracheoesophageal puncture (TEP) has evolved to become the preferable mode of voice restoration post-laryngectomy. Primary fit TEP, defined as creation and fitting of TEP at the time of surgery, is widely considered an acceptable and effective alternative to secondary TEP. However, the timing of TEP

in patients with prior chemoradiation lacks the same consensus, as long-term complication rates and speech outcomes for primary fit TEP in salvage laryngectomy have yet to be elucidated. This study aims to investigate whether primary TEP with intraoperative placement of prosthesis in patients undergoing salvage laryngectomy has comparable short and long-term complication rates and functional outcomes to individuals undergoing primary laryngectomy.

Methods: A retrospective, single-center review was conducted of individuals undergoing laryngectomy with primary fit TEP between 2012 and 2018. Salvage surgery was defined as laryngectomy in any patient with a history of prior neck radiation. Short-term outcomes measured included length of hospital stay, infection/abscess formation, pharyngocutaneous fistula (PCF) formation, prosthesis extrusion, peristomal dehiscence, and Emergency Department (ED) visit/hospital readmission within 90 days of discharge. Long-term complications included prosthesis extrusion up to a year post-surgery and necessity of stricture dilations. Functional outcomes of interest were time to TEP speech, best fluency at first follow-up, and usage of TEP as primary means of communication at 6, 12, and 24 months.

Results: Of 134 patients who underwent total laryngectomy with primary fit TEP, 73 (54.5%) were primary surgeries and 61 (45.5%) were salvage surgeries. Individuals undergoing salvage surgery were more likely to be Caucasian (86.9% vs 71.2%, p= 0.03), have preoperative hypoalbuminemia (83.6% vs 54.8%, p= 0.0004), , and require a free flap during surgery (93.4% vs 39.7%, p= <0.0001). Conversely, those with primary surgery had higher TNM staging, were more likely to undergo postoperative radiation or chemotherapy, and were more likely to be current smokers (65.8% vs 34.4%). A higher rate of peristomal dehiscence (13.1% vs 1.4%, p= 0.007) was found in the salvage group, with PCF formation trending towards significance (23% vs 11%, p= 0.06). There was no difference found between other complications, including prosthesis extrusion, length of stay, infection, rates of readmission/ED visits, and esophageal stricture requiring dilation. With regards to functional speech outcomes, both groups had good to excellent fluency with the TEP at first visit (79.8% vs 71.8%, p= 0.1) and a greater proportion of those with salvage surgery were utilizing their voice prosthesis at 6 months (90.4% vs 63.1%, p= 0.0007), 1 year (89.1% vs 67.3%, p= 0.009), and 2 years (88.6% vs 69.0%, p=0.04). There was no difference found in time to initiate TEP speech between primary and salvage surgery (mean= 42.3 vs 33.2 days, p=0.2).

Conclusion: Primary fit TEP in salvage laryngectomy has an overall relatively low incidence of short-term and long-term complication while maintaining excellent long-term functional speech outcomes, even when compared to a primary laryngectomy cohort. Primary fit TEP appears to be a safe and effective surgical choice for individuals undergoing salvage laryngectomy who desire a voice prosthesis.

A044: USE OF WEARABLE ACTIVITY DEVICES TO MONITOR POSTOPERATIVE AMBULATION AND SLEEP AFTER HEAD AND NECK SURGERY

Vivek Pandrangi; Suparna Shan; Jennifer Moy; Daniel Clayburgh; Mark Wax; Peter Andersen; Ryan Li; Oregon Health & Science University

Background: Postoperative recovery after head and neck surgery is complex, particularly for patients with head and neck cancer. Early mobilization can impact physical outcomes and emotional well-being. However, postoperative mobility is rarely monitored and functional assessments are vague and lack standardization. Additionally, postoperative sleep disturbances are common and can impact recovery. Wearable activity monitors can provide continuous, real-time monitoring of mobility and sleep. The purpose of this study was to evaluate the use of wearable activity devices to monitor daily ambulation and sleep patterns in hospitalized patients after head and neck surgery.

Methods: This was an observational, prospective study at a tertiary academic hospital from July 2020 to October 2021. Patients undergoing head and neck surgery were included if they had an expected length of stay ≥ 2 days. Subjective daily activity and sleep scores were obtained (scale 0 to 10). A Fitbit Inspire HR device (Fitbit Inc, San Francisco, CA) was placed on patients after surgery. Daily step count was measured as the number of steps taken each day beginning 8am postoperative day one. Sleep parameters measured included total sleep time (TST) and nocturnal awakenings, as measured via Fitbit software, starting postoperative day one from 8pm-8am.

Results: Of the 30 patients in the final cohort, the majority were male (90%) and mean age was 58 ± 10 years. Median LOS was 4 days (IQR:3). Among patients who underwent transoral robotic surgery (TORS) with complete step data available (n=17), step count increased each postoperative day (pearson correlation r=0.53, 95% CI=0.30 to 0.70) that plateaued around postoperative day 5. Among patients who underwent free tissue transfer reconstruction with complete step data available (n=7), step count increased each postoperative day (r=0.29, 95% CI=0.04 to 0.54) that plateaued around postoperative day 3. Higher subjective activity level correlated with daily step counts (r=0.25, 95% CI=0.07 to 0.4). Increased daily opioid use also correlated with daily step counts (r=0.20, 95% CI=0.02 to 0.37). Among 83 data points that accurately captured daily inpatient sleep (estimated 61% capture rate of all postoperative sleep nights), the mean TST was 5.4 ± 2.5 hours. The mean subjective sleep score was 4.9 ± 2.3. TST was associated with subjective sleep score (r=0.25, 95% CI=0.03 to 0.044). Among 65 nocturnal-awakening events evaluated, the majority were associated with use of pain medication, followed by vital sign checks. Among patients with complete step data on postoperative day 1 (n=24), step count ≥ 200 steps was associated with reduced LOS (4.5 ± 1.7 days vs. 7.2 ± 4.0 days, 95% CI=0.33 to 5.0). Among patients with complete step data on postoperative day 2 (n=22), step count ≥ 1,000 steps was associated with reduced LOS (4.6 ± 1.2 days vs. 7.0 ± 3.6 days, 95% CI=0.31 to 4.6).

Conclusions: Wearable activity monitors appear feasible and useful in monitoring postoperative ambulation and sleep patterns. Data from these devices may encourage early postoperative ambulation, creation of objective goals to facilitate recovery, and development of practices to improve sleep quality in the hospital.

A045: PREDICTING OUTCOMES IN HEAD AND NECK SURGERY WITH MODIFIED FRAILTY INDEX AND SURGICAL APGAR SCORES

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Objective: Head and neck cancer surgery can be associated with significant postoperative morbidity. Both the modified frailty index

and modified surgical APGAR score have been used to predict postoperative outcomes in the head and neck cancer population. Our study aims to compare efficacy between the two in predicting postoperative morbidity and mortality.

Methods: This is a retrospective review of patients who underwent major head and neck surgery at the University of Alabama at Birmingham between April 2012 - March 2015. After data collection, modified surgical APGAR score values were calculated according to intraoperative data obtained from anesthesia records on 723 patients. The modified frailty index was calculated by collecting relevant preoperative variables from patient medical records to create individual indices. Primary outcome was 30-day postoperative morbidity and/or mortality.

Results: The mean modified frailty index was 0.11 (1 factor out of 11 going into the index) and the mean modified surgical APGAR score was 6.15. Both modified frailty index and modified surgical APGAR score were associated with 30-day postoperative morbidity ($p<0.05$ for both). When compared the modified surgical APGAR score was superior to modified frailty index for predicting a complication (ROC area 0.76 vs 0.59, respectively). When used concurrently they provided an ROC area of 0.77, which is not significantly superior.

Conclusion: Both modified frailty index and modified surgical APGAR score are useful tools in risk stratifying patients for postoperative complications. While both provide value, the modified surgical APGAR score proved to be a more sensitive test in our study population. Combining the two scores provided little extra benefit to predicting adverse outcomes.

A046: VELOPHARYNGEAL INSUFFICIENCY AND NASOPHARYNGEAL REFLUX IN IRRADIATED HEAD AND NECK CANCER SURVIVORS

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Purpose: Radiation therapy is a common treatment for head and neck cancer patients, and it is associated with the development of dysphagia in this population. Velopharyngeal insufficiency (VPI) and resultant nasopharyngeal reflux (NPR) contribute to this process. Our first objective was to clinically assess velopharyngeal insufficiency in irradiated head and neck cancer survivors. Our second objective was to assess the sensitivity of Modified Barium Swallow (MBS) in identifying NPR in these patients.

Method: 49 patients were referred to a laryngologist for dysphagia evaluation secondary to head and neck cancer. They were evaluated in clinic with a history and physical exam, with nasolaryngoscopy as relevant, to determine the presence of VPI. They also underwent MBS assessment with a swallow-trained speech and language pathologist, with analysis using Modified Barium Swallow Impairment Profile (MBSimp) to assess NPR and other components of swallow physiology.

Results: Of the 49 referred patients, 18 (36.7%) had clinical VPI as assessed by history, physical exam or nasolaryngoscopy. All 18 patients reported reflux of thin liquids and food at increased frequency relative to pre-treatment state. 15 out of the 18 patients had undergone nasolaryngoscopy at the time of dysphagia presentation. Of these, 14/15 (93.3%) had positive findings detecting VPI in patients who reported NPR while eating. Of the 18 patients with clinical VPI, 14 patients subsequently underwent MBS. In this group, NPR was elicited on MBS in 5 patients (35.7%). The remaining 9 patients (64.3%) with clinical VPI did not demonstrate findings on MBS.

Conclusion: Velopharyngeal insufficiency with resultant nasopharyngeal reflux is a modifiable component of dysphagia in head and neck cancer survivors with treatment including injection augmentation of the pharynx. In this study, we found that VPI is common among this population, and it can be underestimated on MBS. Clinical evaluation of VPI with history, physical exam and nasolaryngosocopy should be included in dysphagia management of irradiated head and neck cancer survivors.

A048: IMPLEMENTATION OF AN ELECTRONIC REMOTE SYMPTOM MONITORING PLATFORM FOLLOWING HEAD AND NECK SURGERY

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Background: In head and neck surgery, despite significant complexity and high symptom burden, a significant portion of patients' recovery time is spent at home. We present an electronic platform for remote symptom monitoring developed and implemented for patients with head and neck cancer.

Methods: Post hospital discharge days 1-10, patients report their symptoms via an electronic questionnaire delivered through an in-house developed informatics platform. Head and neck-specific content was developed with input from a multidisciplinary team (physicians, nurses, administrators, patients) and adapted from the National Cancer Institute's validated symptom assessment instrument (Patient-Reported Outcomes version of the Common Terminology for Adverse Events (PRO-CTCAE™)). Fifteen total symptom domains are assessed using a Likert scale for severity. Moderate severity prompts a "yellow alert," notifying the nursing team via a secure patient portal message that follow-up with the patient is necessary. Severe symptoms prompt a "red alert," notifying the nursing team to urgently contact the patient. Patients were considered to be "responders" if they completed at least one survey.

Results: Since implementation (5/2021), 231 head and neck surgical discharges have been enrolled in remote symptom monitoring, of which 175 (76%) were responders. The median time for survey completion was 1 minute and a median of 5 out of 10 surveys were completed. 52% of responders (n=91) generated an alert, of which 14% (n=25) were "red" (severe) and 39% (n=68) were "yellow" (moderate). Across the whole cohort, pain was the most common cause for alert (n=4 red, 2%; n=16 yellow, 9%), followed by constipation (n=17 yellow, 10%).

Conclusion: The implementation of this platform has allowed for head and neck surgical patients to be closely monitored after discharge. This is feasible and patients respond at home. Electronic reporting provides an additional mechanism of communication between the patient and the clinical team, with the potential for early intervention. Further research is ongoing to determine if remote monitoring results in improved clinical outcomes and decreased acute care visits.

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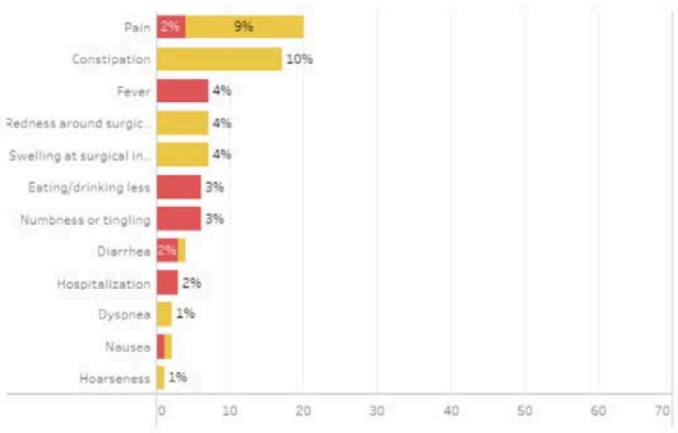
Figure: Symptom Alerts Across Users



A049: THE AREA OF DEPRIVATION INDEX CAN PREDICT THE IMPACT OF NEIGHBORHOOD-LEVEL FACTORS ON DISTRESS AND QUALITY OF LIFE AMONG HEAD AND NECK CANCER SURVIVORS

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Background: Socioeconomic deprivation increases the risk of poor health outcomes and quality of life in head & neck cancer (HNC) survivors. There is minimal data on how neighborhood and community-level factors, such as access to transportation, nutrition, education, and housing quality affect patients' reported quality of life measures in H&N cancer survivors. Area-Deprivation Index (ADI) is a validated tool that allows for ranking of neighborhoods by socioeconomic disadvantage, including variables on income, employment, education, and housing quality. The objective of this study was to investigate if ADI can predict quality of life metrics and severity of distress among H&N cancer survivors in western Pennsylvania.

Methods: Prospective data collection was performed at a head and neck cancer multidisciplinary survivorship clinic. Patients with disease recurrence were excluded. Data collected included patient demographics, state and national ADI of patients, and cancer subsite and stage. Quality of life metrics include the University of Washington Quality of Life Questionnaire (UWQOL), Patient Health Questionnaire 9 (PHQ-9), Generalized Anxiety Disorder Questionnaire 7 (GAD-7), and the Eating Assessment Tool 10 (EAT-10). Socioeconomic deprivation was measured by ADI state and national deciles.

Results: HNC survivors (total = 303) included oral cavity (n= 58), oropharyngeal (n= 187), laryngeal and hypopharyngeal (n= 58). 20.79% of patients were stage I/II, and 77.23% were stage III/IV. Zero patients were treated with surgery alone, 7.3% (n= 22) with radiation alone, 40.6% (n= 123) with chemoradiation alone, 31.7% (n= 96) surgery with adjuvant chemoradiation, 20.1% (n= 61) with surgery plus radiation, and 0.3%(n=1) with surgery plus chemotherapy. For every increase in ADI national decile, UWQOL-Physical decreased 0.8 (p=0.026), UWQOL-Social decreased 1.5 (p=<0.0001), and GAD increased 0.3 (p=0.005). ADI was not significantly associated with PHQ-9 and EAT-10.

Conclusion: HNC survivors from disadvantaged areas are at a greater risk for anxiety and poorer quality of life, and the ADI may be a useful, clinic-based tool to identify these patients. Further work is needed to better understand these inequities in order to develop effective interventions to optimize outcomes for HNC survivors.

A050: THE DEVELOPMENT OF A SCREENING TOOL FOR COMPLICATED LIVING GRIEF IN HEAD AND NECK CANCER PATIENTS

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Objectives: Complicated living grief (CLG) is a persistent painful emotion of loss in which maladaptive thoughts or dysfunctional behaviors are present. Head and neck cancer (HNC) affects quality of life by negatively impacting form and function contributing to increased anxiety, depression and grief. Unlike anxiety and depression, a standardized screening tool has not been established for CLG. Patients with complicated grief have an increased risk of suicidality and poorer outcomes. Complicated grief therapy has proven to be effective highlighting the importance of identifying patients that would benefit from treatment. Here we describe the construction of a screening tool for complicated living grief using quality of life data, patient feedback and examples from existing validated surveys as well as the process of confirming validity and reliability of our tool.

Study Design: Retrospective review and survey design.

Methods: To construct a screening tool for CLG an established bereavement focused grief questionnaire, Inventory of Complicated Grief, was modified to assess living grief in patients diagnosed with cancer. To obtain preliminary information from existing questionnaires validated in the head and neck population that contained questions that may have some overlap with CLG, a retrospective analysis of 309 patients with HNC who completed the EORTC QLQ-C30 and EORTC QLQ-HN35 at the pretreatment period or during the six month follow-up from 2013-2020 was performed. We then provided the tailored survey utilizing those questions reflective of CLG to 7 HNC patients to rate each question 1 – 5 on a Likert scale and to provide comments on the accessibility and applicability of each question. We finalized the CLG assessment and are currently in the process of performing an exploratory factor analysis on 150 patients which will be followed by a confirmatory factor analysis for final validation.

Results: A total of 16 questions were developed to assess CLG in HNC patients. Three constructs are assessed: 1) yearning and acceptance; 2) emotional response to loss; 3) effect on daily life. QOL factors that worsened at the 6 month follow-up found on our retrospective analysis included problems with sense of smell and taste, eating in front of people, talking, using the telephone, social contact with friends and going out in public (p<0.05). Questions were adjusted using this data to better address socialization, communication and eating in our assessment. Using

patient feedback, we addressed questions scoring less than 4 on the Likert scale and utilized patient comments to make final modifications. The survey is finalized for the next step in validation, the exploratory factor analysis.

Conclusion: The construction of a novel complicated living grief questionnaire will help identify CLG in head and neck cancer patients. Using QOL metrics, an existing validated bereavement focused questionnaire and patient feedback followed by validation using an exploratory and confirmatory factor analysis ensures the assessment accurately screens for CLG in our patient population. Due to the increased risk of suicidality, decreased QOL, and poorer outcomes in patients with complicated grief, identification using a validated screening tool is essential to provide the best care for patients with HNC.

A051: POST-OPERATIVE OPIOID PRESCRIBING PRACTICES AND PATIENT UTILIZATION FOLLOWING TRANSORAL ROBOTIC SURGERY

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Intro: Opioid misuse remains a significant public health concern within the United States, yet prescription opioids represent an important method to manage acute pain especially in the post-surgical setting. There is concern for misuse, divergence, and overdose. Transoral robotic surgery (TORS) is a minimally invasive technique that offers important advantages in the surgical management of oropharyngeal cancers. In general, there is wide variation in opioid prescribing within otolaryngology both across common procedures and within individual procedures, including TORS. This study aimed to characterize opioid utilization in patients undergoing TORS for head and neck cancer, investigate patient perception of their own pain control, and identify factors associated with varied postoperative opioid requirements.

Methods: Patients who had undergone TORS at a tertiary medical center between 2018-2021 were eligible. Eligible patients received up to 3 phone attempts for a survey with questions regarding history of opioid use, opioid prescription utilization, adjunctive analgesic use, need for refill, opioid disposal, and satisfaction with their postoperative pain management. All patients with chronic pain conditions prior to surgery were excluded. A retrospective chart review was then performed to collect data related to patient demographics and medical comorbidities, procedural details, postoperative opioid prescribing, and postoperative outcomes for participating individuals. Primary outcomes included characterization of opioid utilization and analysis of the association between postoperative opioid requirements and patient comorbidities or procedural factors.

Results: The mean number of prescribed opioids (in pill equivalents of 5mg of oxycodone) was 20.1, with a standard deviation of 26.1 and range of 0-112. There were no significant differences in amount prescribed by procedural indication. The majority of patients rated their pain control as "adequate." There was no significant difference in pain control satisfaction by gender, longer length of hospital stay, morphine pill equivalents the day before discharge, morphine pill equivalents the day of discharge, prescription refills and readmission. The majority of patients (>60) used Tylenol and or ibuprofen for pain control. Less than half of the total patients used all their opioid prescriptions. There was no significant difference in analgesic use between varying anatomical TORS procedures.

Conclusions: There is wide variation in opioid prescribing in the context of TORS. In this study, no identified patient factors, medical comorbidities, inpatient opioid requirements, or procedural indications were associated with differing levels of postoperative opioid requirements. Future studies should aim to identify predictive factors that can guide better postoperative pain management, including investigating a multimodal pain protocol, in patients undergoing TORS.

A052: SYMPTOM-BASED REFERRAL PATTERNS USING PATIENT REPORTED OUTCOME MEASURES IN HEAD & NECK CANCER

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Background: Symptom monitoring before, during, and after oncologic treatment is imperative to ensure best patient care and long-term treatment outcomes. Implementation of patient-reported outcome measures (PROMs) alone in the clinical trial setting has improved length of systemic treatment and overall survival, decreased acute care visits, emergency department visits, and improved patient-reported quality of life in patients with metastatic breast, genitourinary, gynecologic, and lung cancers. The mechanism of PROMs efficacy is not clearly defined, and clinical guidelines regarding intervention in response to PROMs is lacking. This study aims to investigate referral patterns in response to PROMs responses in patients with head and neck cancer.

Materials and Methods: Multidisciplinary implementation of PROMs was initiated September 2020 involving surgical/medical/radiation oncology. PROMs were recorded for each clinic visit and made available at the time of the provider assessment. Any adult patient with a diagnosis of head and neck cancer with a visit to an oncology care provider were eligible for inclusion. Referrals to Speech-Language Pathology (SLP), Psychology-Oncology, Wound Care, Physical/Occupational Therapy, Nutrition, Endocrinology, Palliative and Pain Medicine, Integrative Medicine, or Dentistry were recorded following each visit. T-tests and univariate logistic regression were used to make comparisons between patients and PROMs scores that resulted in a symptom-based referral.

Results: A total of 176 patients were included from September 2020 to June 2021. Median age was 61 years (range: 23 to 91 years) and 116 were male (65.9%). Our sample included 129 patients who identified as White and 34 patients (20.1%) as Black. Nine patients (5.5%) presented with T0, Tx, Tis classification disease, 96 patients (58.5%) with T1 or T2 disease, and 59 patients (36%) with T3 or T4 disease. In total, 38 referrals were made across a total of 219 patients, which includes 13 patients (34.2%) with multiple referrals during the same visit. Most referrals were made during treatment surveillance (n=29, 76.3%). No patient characteristics or PROMs responses were associated with referral. The mean PRO depression score was 50.1 (standard deviation [SD]=10.81) when a referral was made versus 49.93 (SD=9.38) when no referral was made with no significant difference in the odds of referral (odds ratio [OR]=1.001, 95% Confidence Interval [CI] = 0.958-1.046). The mean PRO fatigue score was 51.03 (SD=9.43) when a referral was made versus 50.92 (SD=9.93) when no referral was made (OR 1.00, CI=0.965-1.037). The mean PRO pain score was 55.26 (SD=9.62) when a referral was made versus 53.19 (SD=10.47) when no referral was made (OR 0.986, CI=0.986-1.054). The mean PRO physical function score was 42.87 (SD=10.25) when a referral was made versus 44.55 (SD=9.87)

when no referral was made (OR 0.947, CI=0.947-1.020).

Conclusion: This study demonstrates PROMs complication in a diverse group of patients with head and neck cancer. Symptom-based referrals occurred in approximately a third of patients with most occurring during surveillance. While no PROMs domain score was associated with referral, further investigation including longitudinal data may allow for further understanding of the role of PROMs in symptom management in patients with head and neck cancer.

A053: TOPOGRAPHIC AND HISTOLOGIC CHARACTERISTICS OF THE ANSA CERVICALIS NERVE FOR NERVE GRAFTING IN FACIAL PALSY

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Introduction: Facial paralysis after a head and neck tumor resection may significantly impact patient`s quality of life with overwhelming functional, aesthetic, social, and emotional affections. Different treatment modalities have been described for facial reanimation, being the most widely accepted muscle transposition and nerve grafting. A suitable graft is selected based on the nerve diameter, number of myelinated axons, nerve length, and ease of access. However, harvesting these nerve grafts may cause loss of sensitivity in the donor site and restoration of facial expression is variable. For many head and neck cancers, a neck dissection is performed to remove locoregional lymph nodes, and the ansa cervicalis (AC) nerve is routinely removed during this procedure. The objective of this study is to analyze the histological characteristics of the AC nerve in order to assess its suitability as a nerve graft to treat facial paralysis.

Material and Methods: Ansa cervicalis nerve specimens from patients undergoing neck dissections were submitted with orientation in formalin. Sequential cross sections of each nerve, from proximal to distal, were embedded in paraffin, sectioned at 4 microns, and immunostained with antineurofilament antibodies and counterstained with Luxol Fast Blue. Nerve diameters and the number of axons per nerve, proximally and distally, were measured and counted from digital images using QuPath software.

Results: Eighteen nerve specimens were included in the analysis. The average manual axon count for the proximal and distal nerve sections was 1378 ± 333 and 1506 ± 306, respectively. The average QuPath counts for the proximal and distal nerve sections were 1381±325 and 1470±334, respectively. The mean nerve area of the proximal and distal nerve sections was 206793 ± 10568 µm2 and 222181 ± 64064 µm2, respectively. The mean nerve diameter for the proximal and distal nerve sections were 498 ± 121 µm and 526 ± 75 µm, respectively.

Conclusion: The ansa cervicalis nerve may be a suitable nerve graft for facial nerve reanimation given the number of myelinated axons, average diameter and area of the nerve, ease of harvesting during neck dissection, and no loss of sensation neither motor nor aesthetic consequences.

A054: SARCOPENIA IN HEAD AND NECK CANCER AND ACUTE POST- OPERATIVE MORBIDITY: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Importance: In patients with head and neck cancer (HNC), sarcopenia has been associated with worse long-term survival, although this has not been studied in a surgical population.

Objective: To identify the prognostic value of sarcopenia in adults with HNC, treated with curative surgery, on overall acute post-operative morbidity and subtypes of post-operative complications.

Data source: The Embase, Medline, SCOPUS and CINAHL databases were searched for articles published in English or French from January 1, 1946 to February 4, 2021, using terms such as: sarcopenia, muscle weakness, hand strength, head and neck neoplasms, postoperative complications, fistula, infections, embolism, surgical flaps, wound complications and delirium. The reference section of each article was searched for additional potentially relevant publications. Data were analyzed from March 8-25, 2021.

Study selection: Published randomized trials, observational studies and abstracts reporting the association of preoperative sarcopenia in adults with HNC on acute post-operative complications were included. Two reviewers independently screened studies using Covidence. Disagreements were resolved through consensus, and/or by consulting a third reviewer. Of 2171 studies screened, 35 observational studies were included in the final analysis.

Data Extraction and Synthesis: GRADE was used for abstracting and assessing data, independently by two reviewers. Data were pooled using a random-effects model.

Main Outcome(s) and Measure(s): The a priori primary outcome includes the overall 30-day post-operative complications in patients with sarcopenia and secondary outcomes include acute post-operative major complications defined as Clavien-Dindo complications grade ≥ 3, fistulae formation, flap complications and delirium.

Results: Of 2405 screened studies, 13 studies with a total of 1335 patients from 2002-2019 were included in the final analysis. The meta-analysis revealed a statistically significant association between sarcopenia and the overall rate of complications (odds ratio (OR) 3.02, 95% CI 1.96-4.66, p<0.0001), major surgical complications defined as Clavien-Dindo grade ≥ 3 (OR of 2.61, 95% CI 1.60-4.27, p=0.0001), fistula (OR of 2.30, 95% CI 1.40-3.78, p=0.001), flap complications (OR of 3.01, 95% CI 1.65-5.48, p=0.0003), delirium (OR 3.09, 95% CI 1.62-5.92, p=0.0007). Sensitivity analysis revealed the weaker studies did not significantly bias the results and all studies were included in the final analysis. The level of evidence is moderate for all outcomes, as per GRADE.

Conclusions and Relevance: In patients undergoing curative surgery for HNC, preoperative sarcopenia is associated with higher odds of surgical complications. Further studies are needed to manage and potentially reverse sarcopenia perioperatively to improve surgical outcomes.

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A055: QUALITY OF LIFE AFTER SEGMENTAL MANDIBULECTOMY AND FREE FLAP FOR MANDIBULAR OSTEONECROSIS: SYSTEMATIC REVIEW

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Importance: Osteonecrosis of the jaw (ONJ) worsens quality-of-life, and advanced disease often requires segmental mandibulectomy and bony free flap reconstruction. Several studies have investigated patient-reported quality-of-life after surgery, and there is value in systematically reviewing the current literature in order to inform shared decision making.

Objective: Primary objective: review evidence regarding quality-of-life (QOL) outcomes among patients undergoing segmental mandibulectomy and bony free flap reconstruction for advanced ONJ.

Data Sources: PubMed was searched for MeSH terms "Quality of life," "Osteonecrosis," "Osteoradionecrosis," "Bisphosphonate-associated osteonecrosis of the jaw," "Free tissue flaps," and "Mandibular reconstruction." Study references were also searched to include relevant studies.

Study Selection: English language or translated studies with quality-of-life outcomes data for patients undergoing segmental mandibulectomy and bony free tissue reconstruction for advanced ONJ. 194 records were initially screened; 18 full texts assessed; 7 full texts included.

Data Extraction and Synthesis: PRISMA guidelines were followed. Patient-reported QOL outcomes were evaluated for results and patterns.

Main Outcomes and Measures: Primary outcome was patient-reported QOL as measured by several validated QOL surveys used in available studies. Comparisons to pre-operative QOL or to QOL among control groups were reported.

Results: Seven studies were included in this systematic review: four retrospective-only, two retrospective with select comparison groups, and one prospective. According to studies with comparison groups, patients with ONJ have worse self-reported quality-of-life than the general population as well as head and neck cancer patients who do not have ONJ. Nearly all patients with QOL measurements in this review (137/138 patients) had ONJ from prior radiation. Segmental mandibulectomy and bony free flap improved overall QOL in over half of patients, as well as pain associated with ONJ in 70-75% of patients. Surgery did not appear to improve long-term effects of radiation such as chewing, swallowing, and salivary production. Donor site morbidity rarely affects quality-of-life.

Conclusions and Relevance: Patient-reported quality-of-life is an important outcome measure especially in treatment planning for this severe but non-malignant disease. Patients and surgeons may expect improvement in some, but not all, domains of patient-reported quality-of-life by the use of segmental mandibulectomy and reconstruction for advanced ONJ.

A056: EFFECT OF VIRTUAL REALITY ON PAIN MANAGEMENT AFTER HEAD AND NECK SURGERY: A RANDOMIZED CONTROLLED TRIAL

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Background: Postoperative pain management protocols after head and neck surgery have received growing attention to improve patient recovery, reduce hospital stays, and improve patient quality of life, but optimal pain management is challenging. Opioid analgesics have a major role in postoperative pain management, but carry morbidity including sedation and possible dependence. Virtual reality (VR) provides an immersive, three-dimensional (3D) experience that has been explored in a variety of healthcare settings including treatment of anxiety, rehabilitation, and pain control. The purpose of this study was to evaluate the effect of VR on postoperative pain after head and neck surgery using an interactive VR experience compared to a two-dimensional (2D) control intervention.

Methods: This was a single-center, prospective, randomized controlled trial at a tertiary academic hospital of hospitalized patients after head and neck surgery from July 2020 to October 2021 (NCT04464304). Patients were randomly assigned to participate in a fifteen-minute interactive gaming experience (Angry Birds, Resolution Games) using an Oculus Quest VR headset or a smartphone. The primary outcome was post-intervention pain reduction. Pain scores were obtained pre-intervention and post-intervention immediately after the intervention, and then hourly for four hours. Secondary outcomes included changes in opioid utilization and a two-question survey evaluating patient experiences with their intervention using a 5-point Likert scale.

Results: Out of the 30 patients randomized for inclusion, the final population included 14 patients in the VR cohort and 15 patients in the control cohort. The majority of patients were male (90%) and mean age was 58 $\pm$ 13 years. After removal of an outlier identified on graphical analysis, there was a significant difference in pain score reduction among the VR group immediately after intervention use (mean change VR vs. control: -1.8 $\pm$ 1.2 vs. -0.3 $\pm$ 0.6, 95% CI=-2.15 to -0.70). On multivariable analysis, only VR use was associated with a reduction in immediate post-intervention pain score (B=-1.43 $\pm$ 0.35, 95% CI=-2.15 to -0.70). VR patients demonstrated a reduction in 4-hour post-intervention opioid use compared to 4-hour pre-intervention opioid use (mean change VR vs. control: -9.1 $\pm$ 12.4 MME vs. -1.0 $\pm$ 3.9 MME, 95% CI=-15 to -1.3) and a reduction in 8-hour post-intervention opioid use compared to 8-hour pre-intervention opioid use (mean change VR vs. control: -13.5 $\pm$ 18.8 MME vs. 0.5 $\pm$ 10.4 MME, 95% CI=-25.6 to -2.4). There were no differences in responses to the questions "I enjoyed my audiovisual experience," (mean response VR vs. control: 4.5 $\pm$ 0.52 vs. 4.1 $\pm$ 1.1, 95% CI=-0.23 to 1.1) and "I would like to see my audiovisual experience used more often in my healthcare," (mean response VR vs. control: 4.4 $\pm$ 0.76 vs. 3.9 $\pm$ 1.1, 95% CI=-0.17 to 1.3). Responses had high ratings in both cohorts. There were no adverse events due to intervention use.

Conclusions: Use of VR appears to reduce pain scores and opioid use compared to a control intervention. VR may be a useful adjunct for postoperative pain management after head and neck surgery that may facilitate reduction in opioid utilization.

POSTER LISTINGS

A057: THIRTY-DAY HOSPITAL MORTALITY ATTRIBUTED TO OTOLARYNGOLOGY: DOES HOSPITAL QUALITY DATA CORRELATE WITH CAUSE OF DEATH AND SERVICE/PHYSICIAN RESPONSIBLE FOR PATIENTS' CARE?

Jacob Poynter, MD; Peter Dziegielewski, MD; Brian Hughley, MD; University of Florida

Background: Hospital-wide mortality is a focus of many quality reporting initiatives, both by individual hospitals and Centers for Medicare and Medicaid Services(CMS). Traditionally, mortality within 30 days from surgery has been used to represent surgical mortality. However, often mortality is being inaccurately attributed to a service when their care was not directly related to the cause of death. This results in a misrepresentation of performance which can have a negative impact on that service, both within the hospital and as reflected in US News & World Report (USNWR) ranking. Therefore, accurate 30-day mortality statistics are of utmost importance for the hospital, surgeons, and patients, alike. Prior studies investigating 30-day mortality in non-Otolaryngology-Head and Neck Surgery(Oto-HNS) have challenged its validity and significance as a quality indicator of hospital outcomes. This study will evaluate the utility of 30-day mortality attributed to otolaryngology and determine if the cause of death was related to Oto-HNS intervention.

Materials and Methods: After IRB approval, the quality improvement office provided us with a list of patients with otolaryngology-attributed mortalities within 30 days of admission from January 1, 2012 until May 1, 2021. Retrospective chart review was then performed, a database was created, and analysis was performed.

Results: 65 patients with Oto-HNS-attributed mortalities within 30 days of admission were identified. Average age was 67. 41(63%) were male and most were Caucasian (75%). Only 27(41%) patients were primary Oto-HNS patients. The average days between Oto-HNS involvement and death was 16+/-8 and the average number of days from discharge to expiration was 7 +/-6. 39(60%) patients were made palliative, discharged to hospice or had care withdrawn prior to expiration. The most common Oto-HNS intervention performed was tracheostomy (48%), followed by flexible bedside laryngoscopy(13%). Only 7(11%) deaths were related to Oto-HNS intervention. Cause of death related to Oto-HNS intervention included post-operative myocardial infarction (2), aspiration pneumonia (2), respiratory failure (1), intracranial hemorrhage after fall (1) and multiorgan failure (1).

Conclusions: Only 11% of deaths attributed to the Oto-HNS service at a tertiary-care hospital were related to Oto-HNS intervention. The most common procedure performed was a tracheostomy for ventilator dependence. This highlights the fact that mortality is often being inaccurately attributed to a service when their care was not directly related to the cause of death. Follow-up studies are needed to identify better quality data points that more accurately represent performance.

A058: TEMPORAL TRENDS AND CLINICAL CHARACTERISTICS ASSOCIATED WITH POSTOPERATIVE TRISMUS FOLLOWING MANDIBULECTOMY AND FIBULA FREE FLAP RECONSTRUCTION

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BACKGROUND: Trismus following head and neck cancer (HNC) therapy profoundly impairs quality of life through chronic pain and limitations in eating and communication. Many predisposing factors to post-treatment trismus remain unclear, complicating efforts to risk-stratify patients and/or modify treatment. Prior studies in HNC have largely focused on the impact of radiotherapy, while data in surgically-treated HNC patients are lacking. One group of interest is patients undergoing mandibulectomy with osteocutaneous fibula free flap reconstruction (FFFR), as providers may be reticent to initiate jaw stretching exercises out of concern for stressing the newly-placed bone graft. We sought to describe the scope of trismus after mandibulectomy and FFFR, including temporal progression and characteristics associated with trismus outcomes.

METHODS: Retrospective review identified patients who underwent segmental mandibulectomy with FFFR at UCSF between August 2011 and July 2021. Patients with maximum interincisal opening (MIO) measurements both pre-operatively and post-operatively were included; trismus was defined as MIO ≤35 mm. The presence/absence of trismus was determined over two post-operative intervals: early (≤3 months postop) and late (>6 months postop). The absolute change between preop MIO and the MIO at most recent follow-up was defined as ΔMIO.

RESULTS: Over the study period, 46 total patients had at least one MIO recorded both preop and postop. Twenty-six (57%) patients did not have trismus prior to surgery, while 20 (43%) had pre-existing trismus. For patients without preop trismus, the median ΔMIO was -10 mm (IQR -18 to -5), while patients with preop trismus had a median ΔMIO of +1.5 mm (IQR -4 to 8.5). Of 41 patients undergoing ablation for primary malignancy (n=31) or salvage surgery for recurrence (n=10), 30 (73%) received adjuvant radiation/chemoradiation. The surgical indication for five patients

was mandibular osteonecrosis. In patients receiving primary ablation, 75% had trismus at ≤3 months and 47% had trismus >6 months postop. In those undergoing salvage surgery, 100% had trismus at ≤3 months and 75% had trismus >6 months postop. For patients with a posterior mandibulectomy cut involving/removing the ascending ramus, 89% had trismus at ≤3 months and 83% had trismus >6 months. Patients with mandibulectomies preserving the ascending ramus experienced trismus at rates of 79% at ≤3 months and 30% at >6 months.

DISCUSSION: Trismus is common after mandibulectomy with FFFR. This study suggests that while many HNC patients undergoing primary ablation develop trismus in the early postop period, trismus prevalence may decrease at later time points. In contrast, those undergoing salvage surgery appear to be at high risk for persistent long-term trismus. Interestingly, while patients who are trismus-free preop generally experience a sizeable decline in postop MIO, patients with existing preop trismus may exhibit a marginal increase in MIO (though most continued to have trismus post-operatively). Our data also suggest that the location of mandibular resection may modify trismus risk, with involvement/removal of the ascending ramus predisposing to higher rates of long-term trismus than ramus-sparing surgery. Larger studies are critical to validate the strongest predictors of trismus in these patients and inform key intervals for active post-operative trismus intervention.

		≤3 months (n=37)		*>6 months (n=22)*	
		Trismus, n (%)	No trismus, n (%)	Trismus, n (%)	No trismus, n (%)
Surgical Indication	Primary Ablation	18 (75%)	6 (25%)	7 (47%)	8 (53%)
	Salvage	9 (100%)	0 (0%)	3 (75%)	1 (25%)
	Osteonecrosis	4 (100%)	0 (0%)	3 (100%)	0 (0%)
Preoperative Trismus	Present (MIO ≤35)	14 (93%)	1 (7%)	9 (82%)	2 (18%)
	Not present (MIO >35)	17 (77%)	5 (23%)	4 (36%)	7 (64%)
Adjuvant Therapy	CRT	8 (80%)	2 (20%)	6 (75%)	2 (25%)
	RT	10 (77%)	3 23%)	2 (29%)	5 (71%)
	Neither RT/CRT	13 (93%)	1 (7%)	5 (71%)	2 (29%)
Posterior mandibulectomy cut	Involving ascending ramus	16 (89%)	2 (11%)	10 (83%)	2 (17%)
	Preserved ascending ramus	15 (79%)	4 (21%)	3 (30%)	7 (70%)

A059: FEEDING TUBE UTILIZATION IN OROPHARYNX CANCER: A PRELIMINARY 6-YEAR MODERN PROSPECTIVE REGISTRY ANALYSIS

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Importance: Feeding tube utilization portends significant morbidity for patients with oropharynx cancer (OPC), related to symptom burden from tumor mass-effect, chemotherapy/radiotherapy-induced mucosal toxicity, and oropharyngeal damage following radiation or surgery. Historically, patients treated for OPC frequently required feeding tube (FT) placement, with reactive gastrotomy tube (G-tube) rates upwards of 60% published among patients treated at the authors' institution 2003 to 2008.

Objective: To examine current rates of FT utilization in light of advancements in function-sparing treatment and increasing proportions of HPV-related OPC in modern practice.

Design: Prospective cohort study from 2015 to 2021.

Setting: Single-institution NCCN designated comprehensive cancer center.

Participants: Patients with squamous cell cancer of oropharynx or unknown primary were enrolled into an IRB-approved prospective data registry. The analysis sample included 1,135 with new disease at the time of enrollment with at least 1-year surveillance. The majority of the sample comprised AJCC 8th stage I/II (78%), HPV-positive (91%) disease treated with chemoradiation (61%); primary surgery comprised only 16% of the sample.

Interventions or Exposures: Institutional practice included nasogastric or dobhoff tube (NGT/DHT) or gastrostomy (G-tubes) placed reactively due to symptoms before or during RT and prophylactic NGT/DHT at the time of primary surgery. FT insertion/removal, and clinician- and patient-reported outcomes were collected by chart abstraction and patient interviews at pre-specified time periods.

Main Outcomes: FTs were classified by type (NGT/DHT only or G/J-tube) and FT duration computed, censored at last disease-free follow-up. Statistical analyses compared rates of FT utilization by tumor stage, treatment modality, and HPV status. Kaplan-Meier method with log-rank test was used to compare duration of feeding tube placement between these groups.

Results: Only 401 of 1,135 (35%) underwent FT placement at any time during surveillance, with 262/1,135 (23%) receiving G/J-tube and 145/1,135 (13%) receiving only an NGT/DHT. Median duration of NGT/DHT placement (median = 3 days, IQR 2-12) was shorter than that for G/J-tubes (median = 108 days, IQR 81-171; p<0.0001; Figure 1). Feeding tube duration was also shorter among patients with HPV-positive tumors, those treated for T1-T2 versus T3-T4 disease, and those with primary surgical treatment (log-rank, p<0.001).

Conclusions: In this modern cohort of patients treated for OPC, G-tubes were placed in less than 30% of patients—a greater than 50% reduction from reactive gastrotomy rates reported at the same institution in the prior decade. These results reflect a practice setting of primarily reactive tube placement for symptomatic patients before or during non-surgical management and planned prophylactic NGT/DHT prior to primary surgery alongside a strong emphasis on eating throughout cancer treatment as a pre-habilitation goal. Patients may be counseled that HPV-positive tumors, primary surgical treatment, and smaller tumor size are factors associated with shorter duration of FT utilization.

A060: OLFACTORY DYSFUNCTION AS A BIOMARKER OF FRAILTY IN HEAD AND NECK CANCER

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Background: Although most adults will experience a sensory impairment with increasing age, only olfactory dysfunction (OD) has been associated with increased mortality risk. OD is also independently associated with frailty. This suggests OD may serve as a physiologic or clinical marker of underlying pathology associated with decreased survival. Though there is

growing evidence describing the correlation between OD and neurocognitive decline, depression, anxiety, weight loss, and mortality, there have been no studies examining the relationship between OD and frailty in head and neck cancer (HNC).

Objective: To test our hypothesis that greater self-reported OD (sOD) and measured OD (mOD) are associated with increased frailty, we aimed to: (1) Describe the prevalence of sOD, mOD, and frailty in newly diagnosed HNC patients, as measured by the Visual Analog Scale [VAS (0-10)], University of Pennsylvania Smell Identification Test [UPSIT (0-40)], and Risk Analysis Index [RAI (0-81)], respectively; (2) Examine the association between sOD and mOD; and (3) Assess the relationships between sOD, mOD, and frailty.

Study design: Single-site, prospective cohort study from February 2021 to September 2021.

Methods: Eligible participants were aged ≥18 years with newly diagnosed (non-recurrent), treatment naïve, HNC of unknown primary, larynx, hypopharynx, oropharynx, oral cavity, and skin. Patients with a history of COVID, neurocognitive, or primary smell/taste disorders were excluded. UPSIT scores were categorized by age- and sex-adjusted percentiles (stratified into normosmia, mild microsmia, moderate microsmia, severe microsmia, and anosmia). Frailty was operationalized using RAI scores (a composite measure including age, gender, cognition, disability, and comorbidities with functional symptoms) and stratified using validated cutoffs. The relationship between sOD and mOD with frailty were assessed using Kruskal-Wallis bivariate analysis and multivariate logistic regression, respectively.

Results: Of 83 eligible patients, 31 (37.3%) declined participation and 1 (1.2%) had incomplete data, yielding a final cohort of 51 (61.4%) for analysis [39 male (76.5%); 41 of white race (80.4%)]. Upon frailty assessment, 24 (47.1%) were deemed frail (36≤RAI≤44) and 4 (7.8%) were very frail (RAI≥44). Despite a mean sOD score of 8.53±1.92 (higher scores demonstrate better perceived smell), mOD demonstrated 11 (21.6%) patients with mild microsmia, 7 (13.7%) with moderate microsmia, 5 (9.8%) with severe microsmia, and 7 (13.7%) with anosmia. There was no association between sOD and mOD (H = 5.4, p = 0.243). Mean RAI scores across mOD groups were significantly different (H= 10.6, p = 0.038): normal (36.1±3.3), mild microsmia (37±4.4), moderate microsmia (37.4±3.1), severe microsmia (41.6±5.9), and anosmia (39.6±2.9). Multivariate logistic regression demonstrated that the odds of having severe microsomia/anosmia mOD significantly increased with greater RAI scores ([OR:1.21], 95% CI: 1.03-1.49, p = 0.027).

Conclusions: Self-reported olfactory impairment is a poor predictor of measured olfactory dysfunction. Although HNC patients are unaware of olfactory changes, mOD is common and may serve as a bellwether of frailty in this at-risk population. In this prospective cohort, we demonstrate a dose-dependent relationship with increasing degrees of mOD and frailty. Our preliminary findings suggest, for the first time, that OD may function as a biomarker for the assessment of HNC frailty.

A061: QUALITY OF LIFE AND LENGTH OF STAY AFTER HEAD AND NECK CANCER SURGERY AND FREE-FLAP RECONSTRUCTION: A SYSTEMATIC REVIEW

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Importance: Physical, social, psychological as well as surgical factors can affect the quality of life of patients treated for head and neck cancer. However, which specific factors have the greatest influence on quality of life (QoL) remains to be determined.

Objective: To assess which factors (patient, surgical or tumor related) are associated with a worse postoperative quality of life or a longer hospital length of stay (LOS) in patients undergoing major ablative surgery with free-flap reconstruction for head and neck cancer.

Evidence Review: We performed a literature review of MEDLINE, Embase, CINAHL, Web of Science and the Cochrane Central Register of Controlled Trials (CENTRAL) from their inception through June 2021. We included peer reviewed studies that evaluated adult populations of patients who underwent a head & neck cancer surgery with free-flap reconstruction. To be included in the systematic review, studies had to assess the impact of specific patient, tumor, or surgical factors on quality of life (evaluated via a standardized questionnaire) or on postoperative hospital LOS. Two reviewers (L-E.G and N.V.P) independently screened citations based on titles and abstracts for eligibility and extracted data using a standardized and pretested data extraction form. Risk of bias of each study was evaluated using the New-Castle Ottawa Scale (NOS). Narrative analyses and summary of relevant findings were performed for factors associated with both QoL and postoperative hospital LOS. Median LOS for patients undergoing free flap reconstruction for head & neck cancer was also calculated.

Findings: 1456 articles were initially identified and 37 articles were included in the systematic review. We found mixed, and sometimes contradictory results concerning factors associated with both QoL and postoperative hospital LOS. However, some factors may be more constantly associated with worse long-term quality of life. These factors included: dysphagia, radiation therapy exposure, postoperative complications and site of cancer such as the oral cavity and larynx. Older age and size of primary tumor (by TNM staging) were inconstantly associated with lower QoL. Very few studies evaluated the impact of psycho-social factors, such as anxiety and depressive symptoms on long-term QoL. Regarding our secondary outcome, some factors correlated with LOS. These factors included: use of postoperative standardized care protocols (ex. Enhanced Recovery After Surgery - ERAS), postoperative complications and operative time. Older age was inconstantly associated with longer length of stay.

Conclusions and Relevance: Factors related to the patient, the tumor itself or the surgery may correlate with changes in QoL and LOS. However, these findings are based on very few studies as well as small powered studies. Furthermore, only few studies evaluated the impact of psycho-social factors on QoL and LOS. Future studies are needed to determine specific parameters associated with worse QoL and longer LOS. A better understanding of these factors will allow personalized and overall better quality of care for patients.

POSTER LISTINGS

A063: ASSOCIATION BETWEEN DISTANCE TO CARE AND QUALITY OF LIFE IN PATIENTS WITH HEAD AND NECK CANCER

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Background: A consistent and unexpected association between distance to a treatment center and overall survival in patients with head and neck cancer has been reported in the literature. The greater the distance traveled, the greater the rate of survival. However, it remains to be seen whether there also exists an association between distance to treatment center and quality of life (QOL), a clinically significant patient-centered variable. This study investigates the role of distance to the treating facility as it relates to QOL in patients with head and neck cancer.

Methods: This was a retrospective observational study of 95 patients with head and neck squamous cell carcinoma (HNSCC) who underwent treatment at the Milton S. Hershey Medical Center and completed University of Washington Quality of Life (UWQOL) and Short Form 20 (SF-20) questionnaires between the years 2017-2021. The primary outcome of QOL was quantified utilizing the UWQOL and SF-20 surveys. Patient responses were categorized into the domains social/emotional and physical (UWQOL), and physical health, role functioning, social functioning, pain, mental health, and health perceptions (SF-20) for analysis. Distance was calculated using patient home addresses.

Results: Among 95 patients with HNSCC, there was a significant negative association between miles from the treatment site and the UWQOL social/emotional subscale (beta = -0.16, p = 0.035) and the SF-20 mental health subscale (beta = -0.15, p = 0.041), adjusted for survey responses over time. However, these associations were no longer significant with additional adjustment for race, gender, marital status, and insurance type (beta = -0.12, p = 0.09, and beta = -0.10, p = 0.18, respectively). Analysis of other variables, independent of distance to care, indicated that marital status was a significant predictor of UWQOL social/emotional score, driven by the comparison between remaining married versus those who were divorced/widowed (73.2 vs. 59.4, respectively, $p < 0.001$). The same was true for SF-20 physical health (61.9 vs. 41.3, p = 0.010), role functioning (68.2 vs. 31.8, $p < 0.001$), social functioning (85.2 vs. 65, p = 0.004), pain (35.3 vs. 54.1, p = 0.001), mental health (78.6 vs. 65.4, p = 0.002), and health perceptions (47.8 vs. 35.4, p = 0.018) subscales. White race was significantly associated with higher average UWQOL social/emotional score (78.0 vs. 54.1, p = 0.001), lower average SF-20 pain (33.9 vs. 55.2, p = 0.026) and higher average health perceptions score (50.3 vs. 29.1, p = 0.014) compared to non-whites.

Conclusion: The relationship between distance traveled to the treatment center and QOL did not correspond with the positive association between distance and overall survival reported in prior studies. QOL seems to be unchanged in some domains, and may actually be worse in others in patients who travel farther for care. Marital status and race were much stronger determinants of QOL than distance to the treatment center. This emphasizes the importance of a strong support structure for patients throughout their cancer treatment.

A064: IMPACT OF RACE AND ETHNICITY ON SURVIVAL IN THYROID CANCER: A SYSTEMATIC REVIEW

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Introduction: Despite lower incidence of thyroid cancer in Black Americans compared to other racial or ethnic groups, Black Americans have higher rates of regional and metastatic spread and poorer overall survival rates. Thyroid cancer patients with lower socioeconomic status (SES) have been found to have worse survival outcomes, and Black Americans are more likely to score lower on SES metrics. The purpose of this systematic review is to evaluate whether the disparity in survival outcomes in thyroid cancer between Black Americans and non-Hispanic white Americans exists after controlling for SES.

Methods: With an a priori design prospectively registered in PROSPERO, the databases PubMed, Embase, and Scopus were searched. Articles were independently screened by two authors using Covidence. Predetermined inclusion and exclusion criteria were strictly applied, and any disagreements were resolved by a third author. Only articles that controlled for SES in their multivariable analysis were included. To avoid analysis of overlapping sample population in the individual studies, only the studies with larger sample population were included.

Results: Out of 1,183 studies screened, a total of six studies were included in this systematic review (Table 1). Four of the six studies demonstrated that Black American racial groups were associated with poorer overall survival outcomes in thyroid cancer when controlling for SES (Table 2). SES in those studies were measured by county education, county poverty, insurance status, neighborhood SES, hospital surgery volume, and/or annual household income.

Conclusion: This systematic review demonstrates that Black Americans have poorer overall survival in thyroid cancers after controlling for SES in the majority of the reviewed literature. Whether the racial disparity in thyroid cancer survival is due to genetic variance, structural and individual racism, or non-equivalence of SES across racial groups, it is imperative for health care providers to recognize that 1) racial disparity exists and 2) efforts need to be made to overcome the impact that disparities can have in the health of Black Americans.

Tables:

Table 1. Characteristics of included studies

Author	Year	Study Design	Sample Population	Cohort Years	Total WA+BA	Total WA	Total BA	Thyroid Cancer Type	Treatment Modality	Primary SES Measurement
Brown	2010	RCS	ACTUR	1986-2008	4,625	3,979	646	P, F, M	S, R	Access to healthcare
Cox	2016	RCSS	CCR	1988-2011	415	379	36	M	S	Neighborhood SES
Krook	2015	RCS	SEER 18	1988-2009	63,415	58,311	5,104	P, F	S, R	County education, County poverty
Roche	2016	RCS	SEER 18	1998-2011	1,331	1,192	139	M	S, R	County poverty
Semrad	2018	RCS	CCR	1991-2008	14,881	14,072	809	P, F	S, R	Insurance status, Neighborhood SES, Hospital surgery volume
Adam	2014	RCS	NCDB	1998-2006	56,792	53,357	3,435	P	S, R	Annual household income, Insurance status, Hospital surgery volume

ACTUR: Department of Defense Automated Central Tumor Registry; BA: Black American; CCR: California Cancer Registry; F: Follicular; M: Medullary; NCDB: National Cancer Database; P: Papillary; R: Radiation; RCS: Retrospective cohort study; RCSS: Retrospective cross-sectional study; S: Surgery; SEER: Surveillance, Epidemiology, and End Results Program; SES: Socioeconomic status; WA: Non-Hispanic white American

Table 2. Summary of race/ethnicity and overall survival end-point data

Study	HR for OS	95% CI	p-value
Brown 2010	0.942	[0.636, 1.394]	0.765
Cox 2016	1.3	[0.3, 6.1]	0.726
Krook 2015	1.57	[1.37, 1.8]	<0.001
Roche 2016	2.4	[1.45, 3.98]	0.001
Semrad 2018[a]	0.86	[0.59, 1.25]	0.44
Semrad 2018[b]	1.38	[1.1, 1.72]	0.005
Adam 2014	1.39	[1.19, 1.63]	<0.0001

CI: Confidence interval; HR: Hazard ratio; OS: Overall survival
[a]Males [b]Females

A065: DECISION REGRET IN HEAD AND NECK CANCER TREATMENT: A SYSTEMATIC REVIEW

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Background: With decision-making comes the possibility of subsequent regret, a negative emotion that occurs when we imagine that our present situation may be better if we had decided on another option. In medicine, regret can focus on multiple different aspects such as outcomes (regret of the outcomes from the decision), options (regret of the choice that was made among various alternatives), and process (regret surrounding the decision process leading to the choice made). Understanding decision regret provides value for clinicians and patients, as regret can be an important factor in the valuation of treatments and their alternatives. Decision regret has been examined in many cancers, with prostate and breast cancer the most well-studied. However, in head and neck cancer, decision regret has only begun to be explored recently, despite the significant potential head and neck cancer and its treatment have in impairing fundamental processes and characteristics that embody the human experience such as speech, breathing, swallowing, and facial aesthetics.

Objective: To comprehensively describe the available literature on decision regret in head and neck cancer treatment, discuss important future directions, and provide insights into how patients view their treatment decisions in head and neck cancer care with regret in order to improve our ability as clinicians to guide the decision-making process for future patients.

Methods: A literature search for articles related to head and neck cancer decision regret was conducted using the National Institutes of Health PubMed database, which preliminarily identified 1341 articles. Following an initial screen, 29 full-text articles were assessed, and 8 studies were included in the final qualitative synthesis.

Results: The Decision Regret Scale (DRS) was the sole measure of decision regret utilized in all eight studies, and the level of overall decision regret was mild (ranging from 12.3 to 22.1 on the DRS) across these studies. Decision regret was found to be associated with several factors, including dysphagia, difficulty with voice/speech, increased treatment, sadness, and the patient's perception of who made the treatment decision. By contrast, many factors were not associated with decision regret, such as age, gender, marital status, educational level, tumor site, surgical complications, and disease recurrence.

Conclusion: In general, patients have a low level of decision regret following head and neck cancer treatment, but several factors appear to be associated with increased levels of decision regret. Decision regret is an important, emerging area of study that may provide significant insights into how we can better support our patients throughout the treatment process and mature shared decision-making tools for head and neck oncologic care.

A066: A NATIONAL ANALYSIS OF THE EFFECT OF OPERATIVE TIME ON TOTAL LARYNGECTOMY OUTCOMES AND COMPLICATIONS

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Introduction: In this study, we examine the effect of prolonged operative time on outcomes following total laryngectomy.

Study Design: Retrospective Database analysis

Methods: The National Surgical Quality Improvement Program (NSQIP) database was surveyed for total laryngectomy cases performed between 2005-2018. Free flap cases were excluded. The median operative time was identified, and cases were split into 2 cohorts of operative time less than/equal to, or greater than the median. Variables included patient demographics, comorbidities, and outcomes. Univariate and multivariate analyses were performed.

Results: 904 total laryngectomy cases were identified with a median operative time of 368.5 minutes. For patients with higher operative time the mean age was 61.4 ± 9.8, vs. 63.9 ± 11.2 years, ($p<0.001$). Patients with operative time greater than the median were less likely to be emergent cases (0.9% vs. 2.7%, $p<0.05$). On multivariate analysis controlling for comorbidities, prolonged operative time was associated with higher odds of overall surgical complications (OR:2.22 95% CI: 1.64-2.994 $p<0.001$), and bleeding (OR: 2.82, 95% CI: 1.90-4.17 $p<0.001$). Prolonged operative time was also associated with higher likelihood of unplanned reoperation (OR: 2.09 95% CI: 1.39-3.14, $p<0.001$) and prolonged length of stay, defined as greater than median length of stay (9 days), (OR: 1.52, 95% CI: 1.16-2.01, $p<0.05$).

Conclusion: Operative time of total laryngectomy is associated with an increase in overall surgical complications, including bleeding, and with greater chance of unplanned reoperation and prolonged length of stay.

A067: THYROID CANCER INCIDENCE IN NEW JERSEY AND CORRELATION WITH SOCIOECONOMIC STATUS

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Introduction: In 1996, the USPSTF recommended against thyroid cancer screening in asymptomatic patients. Since then, the incidence of thyroid cancer in New Jersey has been higher than nationwide rates. Prior studies suggested that the rates of thyroid cancer rates have increased in populations of higher socioeconomic status. We aim to assess if there is a correlation between incidence and socioeconomic status since the latest screening guideline.

Methods: To investigate the trends of invasive thyroid cancer over time, the New Jersey State Cancer Registry was queried for incidence of invasive thyroid cancer by county for each year from 1996 through 2018. The data includes age-adjusted incidence rates per 100,000 and per 5-year cohort from ages 20 through 84. Public health data, including age-adjusted rates of health insurance coverage by county and rates of cost-related inability to receive healthcare, were collected from the New Jersey State Health Assessment Data. Linear regression was applied to assess the correlation between incidence of invasive thyroid cancer, median income, and lack of insurance.

Results: Between 1996 and 2018, there were 30,821 cases of thyroid cancer diagnosed in New Jersey. The annual count ranged from 497 to 1,931, with a peak in 2013. Females comprised 75.4% of cases, yielding a 3.1:1 female to male ratio. The vast majority of cases (83.9%) arose in the white population, followed by 12.5% in the Hispanic population. The overall age-adjusted incidence rate was 14.7 and the annual age-adjusted incidence ranged from 5.9 to 20.2. Linear regression analysis of annual age adjusted incidence did not show a strong correlation for either median county household income (R2 = 0.1896) or percent of uninsured in the county (R2 = 0.4633).

Conclusion: In contrast to prior studies, our findings demonstrate a lack of strong correlation between annual age adjusted thyroid cancer incidence and socioeconomic status in New Jersey since the 1996 USPSTF guideline against screening for asymptomatic thyroid cancer.

A068: CHARACTERIZING TRIGGERS FOR THYROID ULTRASOUND REFERRALS

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PURPOSE: Thyroid ultrasound (US) as initial imaging for suspected nodules has increased steadily over the past two decades, though the triggers for referral to US are not known. This study examines reasons patients are referred for thyroid US in order to better characterize the diagnostic pathway for nodular thyroid disease and how it may impact observed thyroid cancer incidence rates.

METHODS AND MATERIALS: Patients who were referred to and underwent a primary formal thyroid US at a tertiary care hospital between 2017 and 2019 were identified via electronic health record (EHR). Patients with a history of prior thyroid US or known personal history of thyroid cancer were excluded. The reasons for the thyroid US referral were identified from referring provider documentation and categorized as follows: (a) palpable nodule(s), (b) symptoms (e.g., globus pharyngeus), (c) screening due to presence of risk factors, (d) incidental detection on other imaging study, or (e) metabolic thyroid disease work-up (e.g., hypothyroidism). Referral reasons were not mutually exclusive (i.e., a patient could be referred for more than one reason). Patient and provider characteristics, number of nodules, thyroid and nodule size, radiologist recommendation, and biopsy result if performed were collected. Preliminary descriptive statistics are presented.

RESULTS: To date, records of 760 of 3454 patients (22%) have been fully extracted from the EHR (76% female; mean age 56 ± 16.5 years). The most common referring specialties were internal medicine (262, 44%), family medicine (210, 35%), and endocrinology (59, 10%). The remaining 11% of referrals were made by other specialties. Provider types included physicians (72%), physician assistants (15%), and nurse practitioners (13%). Thyroid US referral reasons, from most to least frequent, were palpable nodule (338, 44%), incidental nodule detection (215, 28%), symptoms (173, 23%), metabolic thyroid disease work-up (49, 6%), and screening due to presence of risk factors (29, 4%). Among referrals for palpated nodules, 55% (186) had a nodule on US. These had a mean size of 1.8 ± 1.2 cm and 63 (34%) met criteria for biopsy. Incidental nodules (2.4 ± 1.1 cm) were most often identified on CT of the chest (64, 30%), neck (35, 16%), and cervical spine (19, 9%). The three most frequent symptoms prompting thyroid US referral were globus pharyngeus (57, 33%), neck pain (56, 32%), and dysphagia (25, 14%). Of symptom-driven referrals, 75 (43%) had nodules on US, with a mean size of 1.4 ± 1.8 cm.

CONCLUSIONS: Preliminary data suggest that a palpable nodule is the primary trigger for thyroid US referral. However, our data highlight the limitations of the physical exam for thyroid nodule detection, as only half of palpated nodules corresponded to a nodule on US. Understanding common reasons for thyroid US referral will help us better identify sources of overutilization, ensure appropriate use of resources, and promote best practices.

A069: VISUALIZATION OF SENTINEL LYMPH NODE WITH A NOVEL FLUORESCENT TAGGED RADIOTRACER IN HEAD AND NECK SURGERY

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Introduction: Recent randomized control trials investigating the role of sentinel lymph node biopsy (SLNB) for early-stage oral cavity squamous cell carcinoma have demonstrated non-inferiority compared to elective neck dissection. With the potential shift toward utilization of SLNB as the standard of care in oral cavity cancer, improved techniques for intraoperative sentinel node identification are needed to expand utilization of this surgical technique. Currently, (99m)technetium-tilmanocept, which specifically binds CD206 within reticuloendothelial cells of lymph nodes, has emerged as an effective radiotracer for SLNB in the oral cavity and demonstrated low false negative rates. However, identification of the sentinel lymph node (SLN) in the head and neck remains technically challenging as radiotracers do not provide visual feedback for sentinel node localization. Recently, a fluorescent tracer conjugated to tilmanocept has shown feasibility for SLNB in prostate and bladder cancer. We conducted the first pilot study using fluorescent-tagged and radiolableled tilmanocept for oral cavity SLNB in a rabbit model which demonstrates high specificity of fluorescent tracer and potential to reduce operative time.

Methods: Six healthy male New Zealand white rabbits were included in the study. 3nmol of (68)gallium-labelled fluorescent molecule, IRDye800, conjugated to tilmanocept in 50ul was injected submucosally into four adjacent sites of the oral tongue,

mimicking peritumoral injection. One hour PET CT imaging was obtained immediately following the injection for planar imaging (Fig 1A). SLNB was then performed on each animal using Fluobeam800 fluorescence imaging camera (Fig 1B & 1C). This was followed by a bilateral neck dissection and sampling of non-nodal tissue adjacent to the SLN(s). Tissue surrounding the SLN, non-sentinel nodal tissue and primary injection site (oral tongue) were measured for radioactivity and fluorescence.

Results: SLNs were identified in the cervical nodal basins of all animals examined. Of these, 5/6 were ipsilateral and 1/6 had contralateral drainage from the injection site. An average of 1.3 SLN were identified per animals. In addition, an average of 5.50±1.05 cervical LNs and 5.00±0.89 submandibular LNs were identified. Injected dose (ID) of radioactive tracer per gram (ID/g) was measured across sampled tissue. SLNs had an average of 9.13±6.21% ID/g compared to non-sentinel nodes with 0.06±0.09% ID/g and surrounding tissue with 0.16±0.10% ID/g (Fig 1D). Relative to the SLN, surrounding tissue had 1.33% fluorescence with a comparable value to background signal. There was a 2.8-fold decrease in time between intraoperative gamma probe (average 3.7±2.1 minutes) and fluorescence imaging (average 1.3±0.5 minutes) guided SLN identification and excision.

Conclusion: Fluorescent-tagged and radiolabeled tilmanocept represents a highly accurate adjunct to improve SLNB in head and neck cancer. Sentinel lymph node identified using intraoperative fluorescence imaging demonstrated high radiotracer activity with minimal signal in surrounding tissue and non-sentinel nodes. The addition of fluorescence provides critical intraoperative visual feedback in relation to surrounding anatomy which can reduce operative times and improve the safety of SLNB in head and neck cancers.

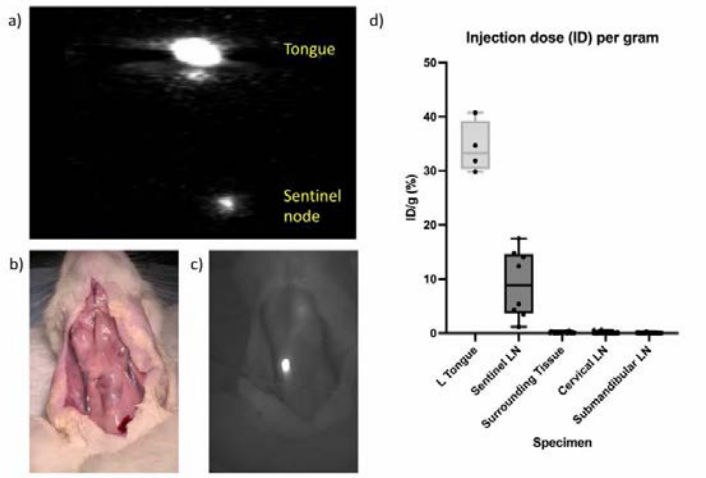

Figure 1. a) Planar imaging showing tongue and sentinel node. b) White light image of exposed neck. c) Corresponding fluorescence-enabled camera image. d) Injection dose per gram in harvested tissue.

A070: INTRAOPERATIVE MARGIN DETECTION OF HEAD AND NECK CANCER WITH DYNAMIC OPTICAL CONTRAST IMAGING: AN IN VIVO MURINE MODEL

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Introduction and Objective: Surgical management of head and neck cancer requires a careful balance between complete resection of malignancy and preservation of function. Positive surgical margins result in worse patient oncologic outcomes, significantly increasing the rates of local recurrence and mortality. Excessive resection of healthy tissue, however, impairs functional outcomes and results in significant morbidity including speech and swallowing deficits. Currently, head and neck surgeons rely upon experience, visual cues, palpation, and frozen sections to determine margins intraoperatively.

Our group has previously reported that Dynamic Optical Contrast Imaging (DOCI), a novel non-invasive imaging system that measures endogenous fluorescence decays rates, can accurately determine margins between malignant and healthy tissues in ex-vivo oral cavity and oropharyngeal squamous cell carcinoma (SCC) specimens. In this study, utilizing an in vivo murine model, we demonstrate that DOCI can accurately identify malignant tissue from adjacent healthy tissue and can guide tumor resection and margins.

Methods: Eight C3H/HeJ male mice were injected subcutaneously into the bilateral flanks with SCC7, a murine head and neck cancer cell line. After two weeks, the mice were anesthetized with weight-based ketamine, and the tumors were surgically exposed. DOCI imaging was performed prior to resection to determine margins and again after excision to detect residual tumor. Both tumor and adjacent tissue margins were sent for permanent histologic sectioning.

Results: All DOCI images were acquired intraoperatively and in real-time (10 seconds per band pass filter channel) and with an operatively relevant wide field of view (0.81 cm2). In all mice and tumor specimens, DOCI images clearly differentiated healthy tissue including fat, muscle, nerve, and skin from malignancy. DOCI values between cancer and adjacent healthy tissue types were statistically significant ($p<0.01$). Post-resection DOCI imaging revealed negative margins in all mice, which was confirmed with permanent histology.

Conclusion: DOCI allows for intraoperative, real-time visualization of malignant and healthy tissue margins to help guide tumor resection. By allowing the surgeon to precisely determine margins intraoperatively, DOCI has the potential to improve patient outcomes.

A071: SURGEON REVIEW OF 4D CT FOR IDENTIFICATION OF PARATHYROID ADENOMAS

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Importance: Preoperative localization of parathyroid adenomas aids in surgical planning for patients with primary hyperparathyroidism.

Objective: To compare the accuracy of surgeon reviewed 4D computed tomography (4D CT) scans versus radiologist reviewed 4D CT for localization of parathyroid adenomas in patients with primary hyperparathyroidism.

Design: A database of patients with hyperparathyroidism who underwent parathyroidectomy at a tertiary care center was developed. A group of randomly selected patients undergoing parathyroidectomy between 1/1/2017 and 4/1/2019 were evaluated. The main outcome measures were sensitivity, specificity, positive and negative predictive value for radiologists and surgeons, and interrater reliability between surgeons. A single surgeon read 4D CT scans blinded to radiologist reads and surgical outcome. A second surgeon, blinded to these results, read the same scans and interrater reliability was calculated using the kappa statistic.

Setting: Tertiary care center

Results: 43 patients with primary hyperparathyroidism who had preoperative 4D CT scan imaging available for review were evaluated. 33 were female (76.7%) with a mean age of 62 years and mean BMI of 26.3. When compared by quadrant, primary surgeon-read 4D CT scans demonstrated a positive predictive value (PPV) of 0.81 and negative predictive value (NPV) of 0.95 for localization of parathyroid adenomas in the right superior quadrant compared to radiologist-read 4D CT scans that demonstrated a PPV of 0.52 and NPV of 0.91 in the setting of a prevalence of 0.49. For right inferior quadrant parathyroid adenoma localization, surgeon-read 4D CT scans demonstrated a PPV of 0.57 and NPV of 1.00 while radiologist-read demonstrated a PPV of 0.57 and NPV of 0.95 in the setting of a prevalence of 0.53. In the left superior quadrant (prevalence 0.40), surgeon-read 4D CT scans had a PPV and NPV of 0.53 and 1.00, respectively, compared to a PPV and NPV of 0.29 and 1.00 for radiologist-read 4D CTs. Finally, in the left inferior quadrant, surgeon-read scans had a PPV of 0.53 and NPV of 1.00 and radiologist-read scans had a PPV of 0.53 and NPV of 0.96 with a prevalence of 0.35. When compared by side, primary surgeon-read 4D CT scans demonstrated a PPV of 0.84 and NPV of 0.91 on the right compared to radiologist-read 4D CT scans that demonstrated a PPV of 0.75 and NPV of 0.91 in the setting of a prevalence of 0.74. For left sided parathyroid adenoma localization, surgeon-read 4D CT scans demonstrated a PPV of 0.73 and NPV of 1.00 while radiologist-read demonstrated a PPV of 0.59 and NPV of 0.95 in the setting of a prevalence of 0.51. Interrater reliability between surgeons was moderate with a kappa value of 0.771.

Conclusion and Relevance: In this study, surgeon localization of parathyroid adenoma on 4D CT scan was more accurate than radiologist localization. This difference was greatest in the right and left superior quadrants. Interrater reliability between two fellowship trained surgeons was moderate. This supports the importance of training otolaryngologists to read 4D CT scans in evaluation of patients with primary hyperparathyroidism.

A072: IN VIVO FLUORESCENCE LIFETIME IMAGING IN HEAD & NECK SURGICAL ONCOLOGY: A 92-PATIENT STUDY DEMONSTRATING THE DETECTION OF SQUAMOUS CELL CARCINOMA AND CONFIRMATION OF NEGATIVE MARGINS

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Background: Fluorescence Lifetime Imaging (FLIm), a non-invasive and label-free optical technology, has recently been associated with significant developments in disease diagnosis and surgical oncology in various clinical fields, including H&N cancer. Head & Neck cancer represents the sixth most common cancer worldwide. More than 90% of H&N cancers are squamous cell carcinomas (SCC), which involve the epithelized mucosa of the oral cavity and oropharynx. Because of the shallow depth of penetration (sub-mm to mm scale), the surface presentation of these tumors is well-suited for evaluation by optical modalities such as FLIm. Given the importance of preventing positive margins, coupled with the need for adjunctive technologies to aid surgeons in intraoperative decision-making, FLIm was investigated for its potential to both demarcate tumors in vivo and evaluate surgical margins following tumor extirpation.

Methods: FLIm was used in combination with Transoral Robotic Surgical Platforms (TORS) for surgical oncology procedures involving the oropharynx (N=53), in addition to non-TORS surgical workflows for procedures involving the oral cavity (N=39). A point-scanning FLIm apparatus (UV excitation at 355 nm) acquired in vivo optical measurements via a fiber optic probe (365 µm core). Spectral autofluorescence emission was evaluated at 390/20 nm, 470/14 nm, 542/25 nm, and 629/26.5 nm, associated with the autofluorescence emission maxima of collagen, NADH, FAD, and porphyrins respectively. A random forest machine learning classifier was trained and evaluated on the 92-patient FLIm database and leveraged to determine diagnostic accuracy based on the classifier output. Validation was performed using histopathology.

Results: Among the 92 patients investigated, 28 patients presented with cancer of the oral tongue, 32 patients with palatine tonsil cancer, 17 patients with base of tongue cancer, and 15 patients with tumors at other locations (e.g., buccal mucosa, floor of mouth, retromolar trigone, etc.) When the entire FLIm database was used to train the classifier, an average receiver-operator-characteristic area-under-the-curve (ROC-AUC) of 0.76±0.13 was obtained at the point measurement level across all patients. When training data was restricted to the oral cavity only, a mean ROC-AUC of 0.86±0.14 across the 28 oral tongue patients was obtained. The base of tongue and tonsils (anatomy of the oropharynx) yielded an ROC-AUC of 0.79±0.10 and 0.72±0.14 respectively. The cohort of "other" anatomic sites resulted in the lowest mean ROC-AUC 0.69±0.14. Among the 92-patient cohort, 3 patients had positive surgical margins evaluated by FLIm. Linear discriminant analysis, which integrated all FLIm lifetime and intensity parameters, yielded a collective ROC-AUC of 0.87±0.09 for these residual tumor patients.

Conclusion: The results suggest FLIm may be a useful diagnostic adjunct for initial SCC tumor demarcation and for the confirmation of negative surgical margins. It is anticipated that with the generation of a larger FLIm database, combined with the further optimization of the classifier (e.g., different models and analytical parameters), this accuracy will continue to improve.

POSTER LISTINGS

A073: IDENTIFYING INTERPRETABLE RADIOGRAPHIC BIOMARKERS IN MACHINE LEARNING MODELS TO PREDICT OUTCOMES IN OROPHARYNGEAL CARCINOMA.

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Background: Machine learning (ML) models have begun to be applied to a wide array of head and neck cancer topics with the hope of assimilating an extensive amount of clinical data, such as patient images, to improve prediction of important oncologic outcomes. However, despite relatively promising prediction accuracy of numerous models described in our current literature, full adoption of machine learning models are constantly held back by functioning as a "black box" where certain imaging features used in the model are not known or not 'interpretable' by humans. This inherent quality of ML significantly limits application and integration to clinical practice. We describe the identification of interpretable imaging features to predict distant metastasis in oropharyngeal carcinoma within the context of a novel machine learning technique. The purpose of this study is to demonstrate the feasibility of obtaining objective yet understandable radiographic biomarkers from machine learning models for clinical use.

Methods: A total of 298 patient PET/CT Images were obtained through the Cancer Imaging Archine (TCIA). All patients had oropharyngeal carcinoma, of which 124 patients had available HPV status (63% positive and 37% negative) with a total of 40 (13%) who developed distant metastasis. The input models were based on inputs of chosen 2-dimensional CT slices where the cross-sectional area of the tumor is the largest. We chose to include 3 measurable features that could be calculated from the data; 'overall brightness,' 'tumor extent,' and 'aspect ratio' (ratio of the long versus short axis of the tumor). We utilized a novel "gradient flow" machine learning technique to encourage our model to use our designated interpretable features and compared this against randomly generated (non-interpretable) imaging features. This data was split into a training set of 209 patient scans and test set of 89 images.

Results: In terms of overall accuracy to predict distant metastasis, the randomly generated model achieved a 68.1% balanced accuracy compared to an improved 68.8% accuracy when trained to incorporate interpretable features. To quantify if our interpretable features were statistically significantly better than random, a Kolmogorov-Smirnov (KS) test was performed. Using all three interpretable features in a combined 'enhanced' model resulted in a statistically significant increase ($p < 0.001$) in interpretability measures without affecting the performance of the overall predictive ability of the model. Furthermore, using all three interpretable features accounted for 19% of the model's predictive magnitude, a relatively large contribution from just a few defined features.

Conclusions: We describe a novel concept within machine learning applications to head and neck cancer, directed at identifying interpretable imaging features to predict important oncologic outcomes. We demonstrated 3 significant imaging biomarkers that can be easily calculated and fit to a model to predict distant metastasis in oropharyngeal carcinoma patients. By identifying measurable features to then encourage the machine learning models to use in the prediction, we have highlighted a potential method to elucidate machine learning models for practical clinical use in imaging for oropharyngeal carcinoma.

A074: IMMUNE DYNAMICS IN RESPONSE TO PD-1 BLOCKADE IN MURINE ORAL CAVITY CANCER

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Background/Objective: Immune dysfunction is important in the development and progression of head and neck cancer. Elucidating our understanding of immunologic changes in response to treatment is essential for patient care. Mass cytometry by time-of-flight (CyTOF) is a method that can identify and quantify >40 immunologic markers with single cell resolution, allowing characterization of the systemic immune landscape. The objective of this study was to characterize early immunologic changes in response to PD-1 blockade in a murine model of oral cavity cancer (MOC1).

Materials/Methods: Sixteen wild-type female C57BL/6 mice underwent heterotopic implantation of MOC1 cells into the left subcutaneous flank. When tumors grew to ≥100mm3 (day 0), mice were randomized to anti-PD-1 or placebo treatment. Tumor volumes were recorded daily, and treatment was administered on day 0, 2 and 4. On day 7, tumor, regional draining lymph node and spleen were harvested. All tissue preparation for CyTOF was performed simultaneously, stained with the same antibody panel, and analyzed on a mass cytometer. Data were normalized using a standardized normalization algorithm. Immune cell populations were determined through serial manual gating, and percentages of these populations were compared using student's t-test. Tumor growth was compared using a mixed effects model. Response to treatment was defined as <50% tumor volume growth at day 7.

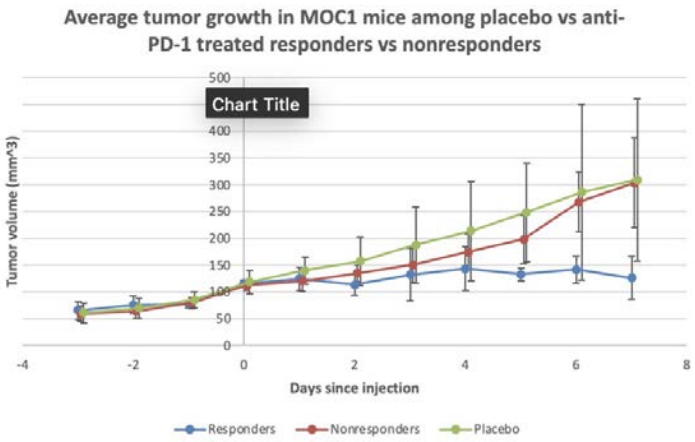
Results: Individual tumor growth was highly variable in placebo versus anti-PD-1 treated MOC1 mice. Tumor growth was slower in the PD-1 treated responders compared to non-responders ($p<0.001$, Figure 1). Responders to PD-1 treatment showed decreased percentage of neutrophils in the spleen compared to non-responders (1.5% versus 10%, $p<0.001$). There were increased percentages of regulatory, CD4+, and CD8+ T-cells in the spleen in responders versus non-responders (Table 1). No differences were seen in T-cell populations in the tumor or lymph node tissues.

Conclusion: MOC1 tumor growth is variable, even within mice treated with anti-PD-1 therapy. Several systemic changes in the immune system are observed in response to PD-1 blockade. Further analysis is required to determine myeloid cell and T-cell dynamics in the peripheral immune system and tumor microenvironment, in order to improve our understanding of the systemic immune response in this tumor model.

		Percent total leukocytes		
Tissue type	**Cell type**	**Nonresponder (N=6)**	**Responder (N=3)**	**p-value**
Spleen	CD4+ T cells	13.3	15.8	0.002
	Regulatory T cells	1.1	2.1	0.03
	CD8+ T cells	9.5	11.6	0.01
Lymph node	CD4+ T cells	17.4	17.3	0.96
	Regulatory T cells	2.7	2.3	0.23
	CD8+ T cells	17	19.1	0.17
Tumor	CD4+ T cells	5.6	5.9	0.73
	Regulatory T cells	3.0	2.5	0.56
	CD8+ T cells	4.5	8.1	0.06

Figure 1

POSTER LISTINGS



A075: BLOOD EOSINOPHIL COUNT MAY PREDICT SEVERE IMMUNE-RELATED ADVERSE EVENTS DUE TO NIVOLUMAB IN RECURRENT OR METASTATIC HEAD AND NECK SQUAMOUS CELL CARCINOMA

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Background: Immune-related adverse events (irAEs) caused by immune checkpoint inhibitors have been reported as favorable prognostic factors in various types of cancer. However, no factors that can predict irAEs have been established. This study aimed to investigate the possible predictive factors of irAEs in patients with recurrent or metastatic head and neck squamous cell carcinoma (RMHNSCC) treated with nivolumab. We analyzed the association between the occurrence of irAEs and several clinical factors, including blood eosinophil count, because we noted a significant increase in blood eosinophil count in patients who had to discontinue nivolumab due to severe irAEs.

Methods: A retrospective study was conducted on 62 patients with RMHNSCC who were treated with nivolumab between January 2017 and April 2021. We investigated the data for baseline characteristics, incidence and grade of irAEs, and treatment outcomes. To examine the association between blood cell counts and irAEs, we compared the fluctuation in blood cell counts in patients with and without irAEs.

Results: The median age of all patients was 66 years, and the median observation period from the start of nivolumab treatment was 16.9 months. Twenty-one patients (33.9%) experienced irAEs. The distribution of irAEs was as follows: endocrine dysfunction (n=9), skin rash (n=7), oral mucositis (n=3), enteritis (n=2), elevation of liver enzyme levels (n=1), pneumonitis (n=3), and arthritis (n=1). Among these, 10 were grade 1, 12 were grade 2, and three were grade 3. Six patients (9.7%, four with pneumonitis, one with liver dysfunction, and one with oral mucositis) discontinued nivolumab due to irAEs. Three of them received subsequent treatment, and the rest did not receive further anti-cancer therapy. Patients were divided into the irAEs group and the non-irAEs group. The median progression-free survival (PFS) was 12.1 months and 1.9 months in the irAEs group and non-irAEs group, respectively ($p<0.001$). The median overall survival (OS) was 33.1 months and 12.8 months in the irAEs group and the non-irAEs group ($p=0.037$), respectively. In patients with treatment discontinuation due to irAEs, the median PFS was 11.5 months and the median OS was not reached, which was comparable to the results in patients who continued nivolumab even after the occurrence of irAEs.

The rate of increase in blood eosinophil count (highest during nivolumab therapy/baseline) was significantly higher in the irAEs group than in the non-irAEs group (median: 3.20 vs.1.98, $p=0.040$). Furthermore, the rate of increase was especially high in patients who discontinued nivolumab due to irAEs (median: 5.61); blood eosinophil levels peaked several weeks before the occurrence of irAEs.

Conclusion: IrAEs due to nivolumab therapy can predict favorable treatment outcomes. Severe cases who discontinued nivolumab achieved long-term survival, even without subsequent treatment. Blood eosinophil counts significantly increased during nivolumab treatment in the irAEs group, especially in patients who discontinued nivolumab due to irAEs. These results suggest that the monitoring of eosinophil fractions during treatment may predict the development of irAEs, and the increase in the blood eosinophil count may correlate with tumor-infiltrating eosinophils.

A077: REAL WORLD OUTCOMES IN PATIENTS WITH HNSCC TREATED WITH CHECKPOINT INHIBITION

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Purpose/Objective(s): Immune checkpoint inhibitors (CPI) are now part of standard therapy for patients with recurrent/metastatic squamous cell carcinoma of the head and neck (R/M SCCHN) in both first and later-line settings. These approvals were based on improved survival compared to chemotherapy in clinical trials. Data on real-world outcomes in patients with SCCHN treated with CPI is limited. We examined clinical outcomes and association with key covariates in a large single-institution cohort of patients with SCCHN treated with CPI therapy.

Materials/Methods: We identified consecutive patients with confirmed SCCHN treated at our institution with CPI therapy for recurrent/metastatic disease from 1/2015 to 8/2021. Baseline characteristics, radiographic response to CPI (defined as investigator-assessed complete or partial response), and date of death or last follow-up were abstracted through chart review. Overall and progression-free survival from time of CPI initiation were determined by Kaplan-Meier methodology and compared using log-rank test and Cox regression.

Results: In our 232-patient cohort, 180 (77.6%) patients were male, median age was 62.7 years (range 28.6-87.4), 158 (68.7%) were former or current smokers, and 30.43 (19.8%) had ECOG performance status (PS) ≥2. Primary tumor sites included oropharynx (n=99), oral cavity (61), larynx (37), hypopharynx (15), nasopharynx (9), salivary gland (4), nasal cavity/paranasal sinus (2), and unknown primary (5). Of 180 evaluated patients, 51% had

HPV-associated SCCHN. The majority of patients (119, 53.2%) had distant metastatic disease at time of CPI initiation, 82 (35.8%) had unresectable locoregional recurrence only, and 25 (10.9%) had both. Treatment regimens included pembrolizumab (n=175), nivolumab (n=29), and pembrolizumab with chemotherapy (n=27). CPI was given as first-line systemic therapy in 146 (62.9%) patients, and as second or later line for 86 patients (37.1%).

Response rate overall was 33.7%; HPV+ status was associated with higher response rate (67 vs 33%, p=.008). As of 8/15/2021 data cutoff, median overall and progression-free survival were 14.5 months and 2.7 months, respectively. Estimated 1-year OS and PFS were 54.5% and 10.3%, respectively. On multivariable Cox regression adjusting for age, sex, HPV status, line of therapy, and disease stage at presentation, factors significantly associated with improved overall survival were non-oral cavity primary site (HR 0.57, p=0.009), T stage<4 at presentation (HR 0.66, p=0.032), and ECOG PS<2 (HR 0.59, p=.004). PD-L1 positivity (CPS≥1) was seen in 86/107 evaluated patients (80.37%); neither CPS≥1 nor CPS≥20 was significantly associated with response or survival.

Conclusions: In a real-world cohort of patients with SCCHN treated with CPI therapy, outcomes were comparable to those seen in clinical trial settings. Patients with HPV+ HNSCC had improved response rates, while oral cavity site, T4 stage at presentation, and ECOG PS≥2 were associated with inferior overall survival.

A078: RACIAL REPRESENTATION IN CLINICAL TRIALS OF IMMUNE CHECKPOINT INHIBITORS IN HEAD AND NECK CANCER

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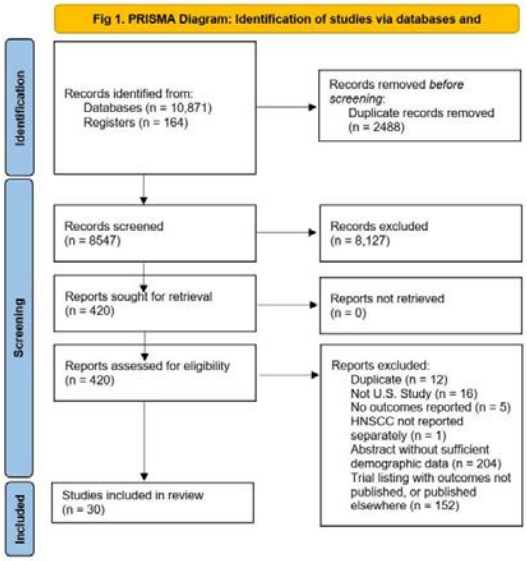
Introduction: The use of PD-1/PD-L1 and CTLA-4 checkpoint inhibitors for the treatment of head and neck squamous cell carcinoma (HNSCC) has been an active field of research in recent years. Major clinical trials in this area have primarily recruited subjects from the U.S., Europe, and Asia, with low recruitment among non-White participants. The goal of this project was to conduct a review of the demographic and racial representation in clinical trials of checkpoint inhibitors that recruited subjects from among the U.S. population.

Methods: A systematic review was conducted according to the Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) guidelines. Included studies were written in English, included subjects recruited from the U.S., and evaluated therapy with checkpoint inhibitors in subjects with HNSCC. The nasopharynx subsite and pan-tumor studies were excluded. Titles and abstracts were screened, and those that were not a clinical trial or did not include checkpoint inhibitors in HNSCC were excluded. After initial screening, full-text articles were reviewed. Studies that did not report demographic data or did not publish outcomes were excluded. Duplicates were removed. Demographic information was extracted for analysis, including number of participants and reported demographic data on race and ethnicity.

Results: The search resulted in 11,035 studies. Following removal of duplicates, 8,547 references were eligible to screen. After initial screening, 420 articles were selected for full-text review. Thirty articles met inclusion criteria, of which 17 (57%) included demographic data and were included for full analysis (Fig. 1). Included studies had a mean of 218 and median of 59 (range, 10-720) participants. These studies included subjects who reported a non-White race/ethnicity with a mean of 17.5% and median of 16.9% (range, 10.0-35.0) of the study population. Among international trials enrolling subjects from North America, Europe, and/or Asia (n = 8), the mean for non-White participants was 17.7%, with a median of 16.9% (range, 9.6-35.0%). Among studies enrolling only from North American populations (n = 9), the mean for non-White participants was 17.3%, with a median of 14.7% (range, 5.1-28.6%). Recruitment of Black/African American subjects among these North American trials had a mean of 4.10% and a median of 1.7% (range, 0-16.7%). Recruitment of Hispanic/Latinx subjects among these trials was even lower, with a mean of 1.2% and median of 0.0% (range, 0-9.1%). Overall, only one study included more than 30% non-White representation.

Conclusions: Checkpoint inhibitors have been approved for first line treatment of patients with metastatic recurrent HNSCC and have been the focus of many recent clinical trials. Our review suggests that clinical trial participants remain largely White, with limited enrollment of Black and Hispanic participants. Further efforts are needed to recruit patients of color and ensure representation in clinical trials in this important area of HNSCC management.



A079: COMPUTATIONAL AND IN VITRO EVALUATION OF SHARED IMMUNOGENIC NEOANTIGENS IN ADENOID CYSTIC CARCINOMA

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BACKGROUND: Salivary gland adenoid cystic carcinoma (ACC) is an aggressive, treatment-resistant salivary cancer. Although primary ACC tumors can be effectively treated with surgery and radiation therapy, there are virtually no therapeutic options for patients experiencing recurrence or metastasis. A hallmark of ACC is the presence of a recurrent fusion transcript. Sixty percent of all ACC tumors harbor the MYB-NFIB gene fusion. MYB-NFIB

fusions may provide a source of cancer neo-antigens. Recently, MHC-Class I binding affinity algorithms have been employed to predict fusion-derived neoantigens. Though most research has focused on elucidating the immunogenicity of single-nucleotide polymorphisms and indels, few studies have characterized the immunogenicity of fusion-derived neoantigens. Here, we propose to evaluate the effectiveness of a neoantigen prediction algorithm to identify unique MYB-NFIB fusion-derived epitopes.

METHODS: 227 ACC tumors were analyzed and 16 unique MYB-NFIB fusion breakpoints identified. We then synthesized synthetic long peptides encoding the top 9 unique MYB-NFIB fusion breakpoints most likely to provide a source of neo-antigens and evaluated the immunogenicity of the predictions through vaccination of mice expressing human HLA transgenes. To perform this task, we harvested and restimulated splenocytes after immunization with synthetic peptides encoding the predicted exact epitopes. T-cell activation was measured using the enzyme linked immunospot (ELISpot) assay. MYB-NFIB fusion derived neo-antigen candidates were determined to be positive if there was a difference in a two-tailed t-test in the mean of the signal for the ELISpot assays between the adjuvant only and the adjuvant and synthetic exact peptide groups.

RESULTS: Of the nine MYB-NFIB predicted epitopes we tested, three demonstrated a positive response and one demonstrated an inconclusive result. Only one exact epitope had an accompanying long peptide that also tested positive.

CONCLUSION: The MYB-NFIB gene fusion generates immunogenic neoantigens and represents an immunotherapeutic target. Computational and in vitro modeling can help identify immunogenic neoantigens.

A080: ONCOLOGIC QUALITY METRICS IN PATIENTS WITH OPERABLE MUCOSAL HEAD AND NECK SQUAMOUS CELL CARCINOMA ENROLLED IN NEOADJUVANT TARGETED THERAPY TRIALS

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Background: Quality oncologic care, including negative surgical margin status, adequate lymph node yield and prompt initiation of adjuvant treatment, impacts disease control and overall survival in patients with mucosal head and neck squamous cell carcinoma (HNSCC). The aim of this study was to ascertain the effect of neoadjuvant systemic therapy given during window trials on oncologic quality metrics in patients with delayed definitive surgery for a HNSCC.

Methods: A pooled analysis of patients with mucosal HNSCC participating in one of four window of opportunity clinical trials at UPMC from 2009-2019. Neoadjuvant regimens consisted of one dose of EGFR inhibitor (n=45), anti-ErbB3 antibody (n=9) or a DNA damage repair inhibitor (n=6) within 28 days of surgery. Sociodemographic, clinical and tumor staging were recorded. The primary outcome was overall oncologic quality, as defined as a composite measure of negative margin status, adequate lymph node yield, completion of adjuvant therapy (if indicated) and time to initiation of adjuvant therapy within 6 weeks of surgery. Secondary outcomes were difference in clinical and pathologic stages and overall survival (OS).

Results: A total of 60 patients with a mean age of 57.6 (±10.6) years and median follow-up of 58 months were analyzed. 38 patients had clinical stage IVA disease with 52% (31/60) oral cavity, 30% (18/60) larynx/hypopharynx and 18% (11/60) oropharynx primaries. All patients underwent surgery following neoadjuvant systemic therapy without delays. In 47 patients (78%), all oncologic quality markers were obtained. There was adequate lymph node yield in all patients. Of the 35 patients who met indications for adjuvant therapy, two patients refused and eleven patients initiated adjuvant treatment beyond six weeks from surgery. The total treatment package time for all patients combined was a median of 3.7 months.

Conclusion: Most patients receiving neoadjuvant systemic therapy on window trials prior to surgery met all oncologic quality markers.

A081: PATTERNS OF DISEASE IN PATIENTS WITH MULTIPLE PARAGANGLIOMAS WITH AN SDH MUTATION

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INTRODUCTION: Paragangliomas (PGLs) are neuroendocrine tumors that can arise sporadically or be associated with inherited pathogenic variants (PV), specifically among the succinate dehydrogenase (SDH) genes. Though patients with multiple PGLs typically have a germline PV, gene-specific phenotype has been limited by the rarity of the familial paraganglioma syndrome. Herein a cohort of patients with multiple PGLs and their associated PV is described to better characterize the relationship between genotype and tumor burden.

METHODS: All patients diagnosed with multiple PGLs at any anatomical location and underwent genetic testing or counseling for their condition were included. We further evaluated patients with head and neck involvement, including carotid body tumors, jugulotympanic PGLs, and glomus vagale tumors. Patients were evaluated at a single tertiary level cancer center between 2005 and 2021. Eligibility criteria included a PV of an SDH gene (SDHA, SDHB, SDHC, SDHD, or SDHAF2) and the presence of multiple PGLs. There were no age restrictions for participants.

RESULTS: A total of 29 patients were included in the study, of which 51.7% were male and 48.3% were female. The median age of included patients was 46 years (range 18-90 years). The mean number of PGL tumors was 3.6 (range 2-6). Among study participants, 93.1% had a head and neck PGL, with the distribution of types as follows: carotid body 72.4% (n=21), glomus jugulare 34.5% (n=10), glomus vagale 13.8% (n=4), glomus tympanicum 6.9% (n=2), thymus or paratracheal PGL 6.9% (n=2), and glomus faciale 3.4% (n=1). Approximately 55% of patients had multiple tumors confirmed only to the head and neck, but 44.8% (n=13) of patients had a tumor at a distant anatomical site, including: intrabdominal/retroperitoneal 31% (n=9), pelvis 10.3% (n=3), mediastinal 6.9% (n=2), and spine 3.4% (n=1). There were 3 secreting tumors (10.3%), all of which were pheochromocytomas. A total of 7 PGLs (24.1%) were found to be malignant at the following locations: glomus jugulare (n=3), pheochromocytoma (n=3), and carotid body (n=1). A majority of patients with multiple PGLs had the SDHD mutation, accounting for 58.6% (n=17) of patients, with 31% (n=9) of patient with an SDHB mutation and 10.3% (n=3) having an SDHC mutation. Among patients with a

malignant tumor, 71.4% (n=5) had an SDHD mutation and 28.6% (n=2) had an SDHB mutation.

CONCLUSION: Using one of the largest single center series with genotype data, this study found that a majority of patients with multiple PGLs have the SDHD mutation, which emphasizes the role of genetic counseling and regular imaging in the management of these patients. Traditionally, SDHB mutations are thought to be the most common mutation in malignant PGLs, however, when multiple PGLs are present, the SDHD mutation is more common. Patients with multiple PGLs and an SDH PV require close clinical follow-up and thoughtful decision-making regarding surgery given the complexity posed by bilateral and secreting PGLs. Given that a majority of patients with multiple PGLs have a head and neck PGL, head and neck surgeons play an important role in the management of their care.

A082: OUTCOMES IN SINONASAL ADENOCARCINOMA: A SINGLE INSTITUTION EXPERIENCE

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Introduction: Sinonasal malignancies are rare, accounting for just 3% of head and neck cancers. Despite being the second most common sinonasal pathology, adenocarcinoma is seen in only 13% of these malignancies. Due to its rarity treatment approaches, prognostic factors, and outcomes are not well-defined. In this study, we aim to review the outcomes of sinonasal adenocarcinoma at a tertiary North American center.

Methods: Following institutional review board approval, patients were identified from an existing institutional tumor database from 1973 – 2018. Demographic, tumor, treatment, and survival variables were summarized in the overall cohort. Survival curves were calculated via the Kaplan-Meier method, and patient, tumor, and treatment characteristics were assessed for association with survival via Cox proportional hazards regression. Factors with p<0.2 in the univariable regression were included in the multivariable analysis.

Results: 52 patients met inclusion criteria. Median age was 57 years (interquartile range [IQR]: 49-66). Males represented 30 (58%) of the cohort. Tumor sites were nasal cavity (23 [44%]), ethmoid sinus (14 [27%]), maxillary sinus (10 [19%] and other (5 [10%]). The majority were primary tumors (46 [88%]). Tumor stages were T3/T4 in 36 (59%). Nodal metastases were seen in 4 patients (8%). Orbital invasion was observed in 6 (12%) patients. Skull base resection was performed in 15 patients (29%). Negative margins were achieved in 32 patients (62%), positive margins in 12 (23%), and unknown margin status in 8 (15%). Adjuvant radiation with or without chemotherapy was used in 28 patients (54%). Five year overall survival (OS) and disease specific survival was 73% and 78%, respectively. Five-year OS was 93% for T1/T2 tumors and 65% for T3/T4 tumors. Five year DSS was 100% for T1/T2 tumors and 69% for T3/T4 tumors. Five year local recurrence free probability was 56%. On multivariable analysis, positive margins and orbital invasion predicted poorer OS (hazard ratio [HR] 2.9 [95% confidence interval (CI): 1.1-7.5] and HR 6.8 [95% CI: 1.6-29.3], respectively). There was no significant association of age (HR: 1.01 [95% CI: 0.98-1.04]), T stage (T3/4 versus T1/2 HR: 1.88 [95% CI: 0.91-5.00]), N stage (N+ vs N0/Nx HR: 1.70 [95% CI: 0.51-5.72]), skull base resection (yes vs no HR: 0.77 [95% CI: 0.28-2.10]), or adjuvant treatment (HR 0.96 [95% CI: 0.44-2.08]).

Conclusion: Here we summarize our institution's experience with sinonasal adenocarcinoma. We described patient, tumor, and treatment patterns. Overall survival was strongly associated with margin status and orbital invasion.

A084: ORAL TONGUE SQUAMOUS CELL CARCINOMA IN YOUNG PATIENTS: A 21 YEAR EXPERIENCE

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Introduction: Oral tongue squamous cell carcinoma (OTSCC) has been previously considered a disease affecting older individuals with a history of smoking and drinking. In recent years, OTSCC in young individuals (age <45 years; young tongue squamous cell carcinoma or YTSCC) has been recognized as a unique entity, with a reported incidence as high as 13% of all tongue cancers.

Objectives: We aim to identify specific demographic factors or clinicopathologic characteristics associated with one year and two year survival in YTSCC patients treated at a tertiary academic center. Additionally, we aim to identify factors associated with recurrence within two years in this group.

Methods: This study is a retrospective review from an academic tertiary care center. A list of all patients from 1999 to 2020 age < 45 years with a pathologic diagnosis of OTSCC were acquired from the pathology department and reviewed. Clinical features of the patients and tumor characteristics were examined for their impact on one year survival, two year survival, and recurrence using univariate and multivariate Cox regression analysis.

Results: Demographic factors and tumor characteristics were identified and compared in 49 patients with a diagnosis of YTSCC. The average age was 31.7 years. Overall survival at two years was 73.5% compared to 93.1% at one year. Recurrence-free survival at two years was 61.1%. On univariate Cox regression analysis of factors associated with decreased two-year survival, tobacco use, tumor size, depth of invasion (DOI), lymphovascular invasion, and recurrence were statistically significant ($p < 0.05$). Female sex was associated with decreased one-year survival, with 13.6% of female patients experiencing mortality within one year compared to 0% of male patients ($p = 0.048$). When comparing factors associated with recurrence within two years, depth of invasion was 1.75 cm in patients with at least one recurrence compared to 0.86 cm in those without a recurrence ($p = 0.03$).

Conclusion: To our knowledge, this is the first institutional study comparing one-year and two-year survival within YTSCC patients. Our results demonstrate that high tumor grade is associated with decreased one-year and two-year survival in these patients and can thus be used as a valuable prognostic indicator. We also noted an association between decreased one-year survival and female sex, further distinguishing the YTSCC group from all patients with OTSCC. Finally, DOI was associated with a higher risk of recurrence within two-years in these patients. Taken together, these findings support consideration of more aggressive upfront management of YRSCC patients with high risk features associated with increased mortality and recurrence.

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A085: WHEN MORE IS LESS: SHORTCOMINGS OF EXCISIONAL BIOPSY IN EARLY-STAGE ORAL CAVITY CARCINOMA

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Introduction: Incisional biopsy is the most common method of diagnosing oral cavity malignancy. However, small tumors may be evaluated with excisional biopsy, in which the entire lesion is removed prior to a known diagnosis of malignancy. Many of these biopsies are performed at institutions that do not perform the definitive oncologic therapy, and this may limit the availability of pathologic data used to make treatment decisions.

Methods: Retrospective series of adult patients (≥19 years) who underwent primary surgery for clinical T1-T2, N0 oral cavity squamous cell carcinoma between January 2018 and December 2020 at a single tertiary referral center. Patients with distant metastasis or recurrent disease at presentation, history of head and neck radiation or major head and neck surgery were excluded. Clinical and pathologic data were extracted from electronic medical records. Biopsies were deemed excisional if no visible lesion was present on initial examination and/or if no invasive tumor was present on resection. Group comparisons were made using one-way analysis of variance, Pearson's chi-square test, and Fisher's exact test.

Results: 160 patients were included (mean age 62.9, 52.5% male, 95.6% non-hispanic white, 62.5% with history of smoking, mean follow-up 70.3 months). The most common subsite was oral tongue (63.1%), and 65.6% of tumors had clinical T1 tumors. Outside excisional biopsy was performed in 28 cases (24.3%), outside incisional biopsy in 67 cases (58.3%), and the initial biopsy was performed at the tertiary center in 20 cases (17.3%). All patients with excisional biopsies underwent re-resections. Among patients with outside excisional biopsies, 18 had residual invasive tumor on re-resection (51.4%), seven had only dysplasia/carcinoma in situ (20.0%), and 10 (28.6%) had no residual disease. Patients with outside excisional biopsies had higher proportions of pathologic T1 tumors ($p<0.001$), smaller mean greatest tumor dimension ($p=0.001$), lower depth of invasion ($p=0.016$), and tumor thickness ($p=0.047$). Among seven pathologic details considered relevant to the primary tumor (T-classification, greatest tumor dimension, depth of invasion/tumor thickness, histologic grade, perineural invasion, lymphovascular invasion, and distance from closest margin), patients with outside excisional biopsies had more missing variables per patient relative to other biopsy types (1.66 vs 0.26, $p=0.001$). The most commonly missing variables were distance from closest margin (n=15, 42.9%), greatest tumor dimension (n=9, 25.7%), and perineural invasion (n=9, 25.7%). Patients with outside excisional biopsies had lower rates of neck dissection (42.9% vs 66.4%, $p<0.001$) and higher rates of regional recurrence (17.1% vs 8.0%, $p<0.001$) compared to other biopsy types. Local and distant control did not differ, and death was less common in the excisional biopsy group (2.9% vs 16.8%, $p<0.001$).

Conclusion: Oral cavity tumors evaluated by excisional biopsy represent a generally favorable subgroup with small tumor size and depth of invasion. However, this method on average provides less pathologic data for which treatment decisions can be made. In the absence of such data, physicians may tend to assume favorable pathologic features and, in some cases, may undertreat patients. These data support incisional biopsy as the standard of care for initial assessment of oral cavity lesions.

A086: RELATIONSHIP BETWEEN AMBIENT AIR POLLUTION AND INCIDENCE OF HEAD AND NECK CANCERS IN ILLINOIS

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Introduction: It is known that individuals exposed to elevated amounts of airborne pollution are associated with increased rates of lung cancer. However, data analyzing the correlation between fine particulate matter pollutants and head and neck cancers is lacking. In this study, we examine the relationship between incidence of oral cancers in a region with the ambient air pollution levels.

Methods: The Illinois Department of Public Health's cancer registry was queried to identify cases of oral and pharyngeal cancer diagnosed in each Illinois zip code between 2014 and 2018. The Environmental Protection Agency's (EPA) Environmental Justice Screening and Mapping Tool (EJScreen) data from 2018 was used to extract ambient air pollution level estimates. Pollutants examined included ozone, particulate mater of less than 2.5 micrometers in diameter (PM2.5), and diesel particulate matter. Air pollutant levels in zip codes within the top quartile of oral/pharyngeal cancer incidence were compared with pollutant levels in the lowest quartile of incidence.

Results: Mean diesel particulate measures were significantly greater in the high incidence group compared to the low incidence group by Student's t-test ($p=0.010$). Mean ozone and PM2.5 levels did not vary statistically between the groups ($p=0.155$ and $p=0.157$, respectively). The high cancer incidence zip codes did have a greater percentage of population over age 65 ($p=0.001$). There was no difference between the two groups in the fraction of minority or low-income populations ($p=0.466$ and $p=0.942$, respectively). A binary logistic regression found both diesel particulate levels ($p<0.001$) and percentage of the population over age 65 ($p<0.001$) to be significant predictors of a zip code belonging to the high vs low incidence group.

Conclusions: Diesel particulate matter levels were found to be associated with oral/pharyngeal cancer incidence. Greater ambient air pollution exposure may be a factor that increases predisposition to developing certain head and neck cancers.

A087: ASSOCIATION OF THE GERIATRIC NUTRITIONAL RISK INDEX AND POSTOPERATIVE COMPLICATIONS IN HEAD AND NECK CANCER

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Background: Malnutrition is associated with increased morbidity and mortality in patients with head and neck cancer (HNC) undergoing surgery. Despite the profound impact malnutrition has on this patient population, objective screening tools are still lacking in a clinical setting. There is thus currently a barrier to capturing malnourished patients, delaying interventions that could otherwise be implemented to optimize their nutritional status and outcomes. Recognizing the need for a tool, the aim of this study is to assess the ability to use the geriatric nutritional risk index (GNRI) to screen for malnutrition among HNC patients and determine if there is an association between GNRI scores and postoperative complications. The GNRI, calculated from serum albumin and ratio of current body weight to ideal body weight, has been used in literature as a prognostic indicator of nutrition-related complications.

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Methods: A retrospective chart review was conducted for patients undergoing surgical resection at a single tertiary academic hospital from June 2012 to June 2021. Patients were included if surgery was the primary treatment modality and if a serum albumin was obtained within the 6 months prior to their surgery. A total of 44 HNC patients were included. Preoperative body weight and serum albumin were collected from medical records. Ideal body weight was calculated by using the patient's height and the Devine formula for adults. GNRI scores were calculated for each patient by using their serum albumin, preoperative body weight, and ideal body weight.

Results: Of the 44 patients included in the study, there were 30 men (68%) and 14 women (32%), with a total mean age of 62 years. Primary tumor sites included oral cavity (59%), oropharynx (23%), and larynx (18%). Free flap reconstruction was performed in 20 patients (45%). Malnutrition was defined by a GNRI score of <97.5 and was present in 12 patients (27%), and 9 of these patients underwent free flap reconstruction. Compared to the control group, the malnourished group had significantly higher rates of postoperative complications (67% vs. 19%; P=.02) and greater number of patients discharged to a skilled nursing facility (33% vs. 6%; P=.04). When assessing the free flap group separately, a higher number of postoperative complications was noted in the malnourished patients (78% vs. 45%), although this did not meet statistical significance.

Conclusions: Results from this study suggest that a low GNRI score is a predictor of increased complications after head and neck surgery. By utilizing accessible metrics, such as albumin, weight, and height, the GNRI efficiently identifies those who are at high risk for perioperative complications. The simplicity of the calculation is also appealing as it can be easily applied in a clinical setting. In the future, further analysis with a larger sample size will be needed to adequately control for confounding variables, such as tumor size and complexity of surgery.

Keywords: geriatric nutritional risk index, malnutrition, head and neck cancer

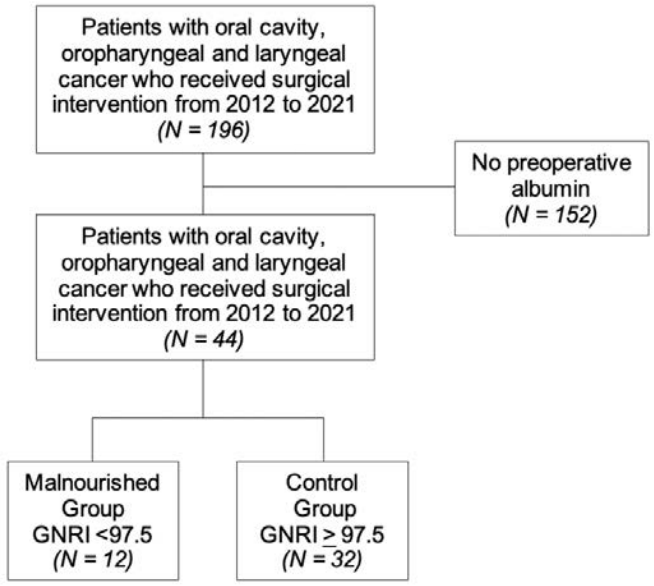

Figure 1. Flowchart of included and excluded patients.

Abbreviations: GNRI, geriatric nutritional risk index.

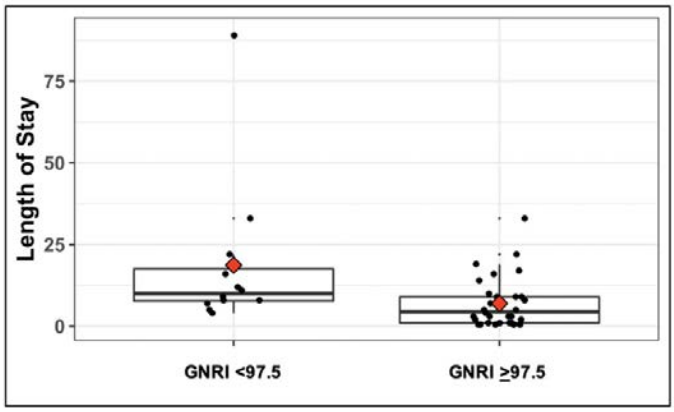

Figure 2 Comparison of length of stay between GNRI <97.5 (N=12) and GNRI ≥97.5 (N=32). The top of the box is the 75th percentile (Q3), the bottom of the box is the 25th percentile (Q1), the middle line is the median, and the red diamond represents the mean. The top whisker is 1.5*IQR+Q3 and the bottom whisker is 1.5*IQR-Q1.

Abbreviations: GNRI, geriatric nutritional risk index; IQR, interquartile range

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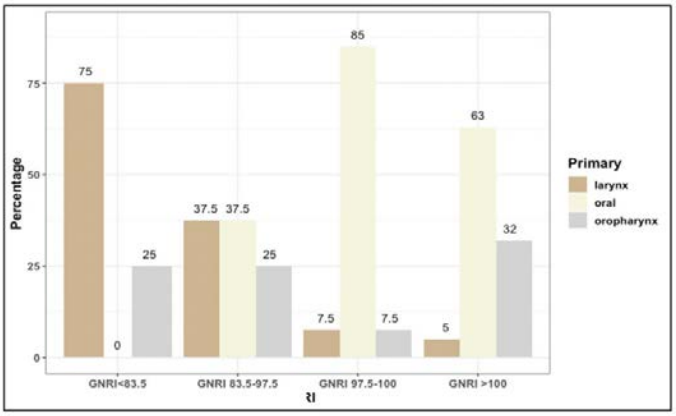

Figure 3. Distribution of primary cancer sites by geriatric nutritional risk index scores.

Abbreviations: GNRI, geriatric nutritional risk index.

A088: PREDICTING PROGRESSION OF ORAL DYSPLASIA TO MALIGNANCY USING MACHINE LEARNING

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Importance: Oral dysplasia is often a precursor to the development of oral cavity squamous cell carcinoma. However, it remains difficult to predict which dysplastic lesions will ultimately progress to squamous cell carcinoma.

Objective: To use machine learning methods to predict progression from oral dysplasia to malignancy using heterogeneous clinical and demographic variables.

Methods: A health system-wide patient database was queried for all adult patients with a diagnosis of oral dysplasia over a thirty year period. Patients who received a diagnosis of oral cavity malignancy after a dysplasia diagnosis were classified as having progressed. A heterogeneous selection of demographic and clinical variables were collected. These included traditional variables associated with head and neck cancer such as smoking status and related diagnoses such as lung cancer, as well as less well studied variables such a chronic steroid use and serum folate levels. Several predictive models for predicting progression were trained and validated.

Results: There were 4576 patients that met criteria as having a diagnosis of oral dysplasia. Of these, 879 (19%) progressed to malignancy and 3697 (81%) did not. Several different machine learning model for prediction of progression had an accuracy exceeding 77%. Several important features for the predictive model were also identified.

Conclusions and Relevance: Machine learning approaches offer promise in predicting progression of oral dysplasia to malignancy using heterogeneous clinicopathologic features and may identify novel risk factors for progression.

A089: UTILITY OF FROZEN SECTION MARGINS IN ORAL CAVITY SQUAMOUS CELL CARCINOMA

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Objective: To determine the accuracy and implications of intraoperative frozen section histopathology (IFSH) margins in oral cavity squamous cell carcinoma (SCC).

Methods: Patients who underwent surgery for oral cavity SCC between 2000-2015 (n=1257) were identified from a prospectively maintained database. In total, 4821 IFSH samples were examined from 1104 patients (88%) who had at least one IFSH. Our general institutional practice has been to harvest margins for IFSH from the tumor bed. Sensitivity and specificity were calculated for IFSH margins compared to the permanent pathology of the same tissue, and for IFSH to the final tumor specimen margin. Margin results were classified in a binary methodology with histopathologic reports interpreted as either negative (including negative or atypia/dysplasia) or positive (including CIS, suspicious, or positive). Patient, tumor, and treatment variables were analyzed between patients with at least one IFSH compared to those without IFSH.

Results: Relative to permanent sections of the IFSH tissue, sensitivity and specificity of IFSH were high (76.5% and 99.9%, respectively), with discordant results in just 24 of 4817 total specimens (0.5%). Final tumor specimen margins were positive for 11.7% of patients (n=147). In comparison to analysis of the final tumor specimen margin, the respective sensitivity and specificity of IFSH for defining margin status was 10.8% and 99.1%. The rate of discordance was 4% (171/4284 specimens) between IFSH and permanent pathology on the final tumor specimen margin. There were significant differences in the distributions for patients with IFSH compared to patients without IFSH for tumor site, with a larger proportion of oral tongue primaries (57.9%) in patients with IFSH and a larger proportion of gingival primaries (39.9%) in patients without IFSH ($p<0.001$). Other significant differences between patients who underwent IFSH and those who did not included higher proportion of pN+ (31.7% vs 21.6%, $p=0.011$) and higher proportion of reported alcohol use (70.6% vs 62.1%, $p=0.033$).

Conclusions: IFSH is accurate when compared to permanent pathology of the same tissue, but less reliable at predicting final margin status on the tumor specimen. Despite a high specificity (99%), the sensitivity of IFSH compared to final specimen margin status is low (approximately 10%). This may be related to the inherent inability of tumor bed IFSH margin analysis to accurately account for the spatial 3-dimensional relationship of tumor margins to the periphery of the specimen. Although tumor bed IFSH is widely used in oral cavity cancer management, our study demonstrates that there are limitations of this modality in predicting the final surgical margin status.

A090: THE ROLE OF LYMPHOVASCULAR INVASION IN THE PROGNOSIS OF ORAL CAVITY SQUAMOUS CELL CARCINOMA

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Background: Lymphovascular invasion (LVI) is defined as the presence of tumor cells within endothelial-lined spaces of lymphatic vessels. It is considered a significant step in the process of cancer metastasis. LVI has been reported as a negative prognostic factor in malignancies such as prostate and colon cancers. However, the prognostic role of LVI in oral cavity squamous cell carcinoma (OSCC) remains unclear.

Methods: We conducted a retrospective review of patients with OSCC who underwent resection at a single tertiary care academic institution over a 15-year period. Patient demographics, surgical pathology results, and clinical outcome data were collected. A multivariable logistic regression model was used to assess the relationship between LVI on the tumor resection specimen and markers such as cervical nodal metastasis, extranodal extension, and recurrence rates. To control for other established negative prognostic factors, analysis was controlled for age, sex, t-stage, adjuvant chemotherapy/radiotherapy, perineural invasion (PNI), and main specimen margin status.

Results: 681 patients were included in the analysis. There were 406 (59.6%) male patients and 275 (40.4%) female patients. The median age at time of treatment was 62.9 years. LVI was present in 169 (24.8%) patients. Cervical nodal metastases were present in 58.8% of patients with LVI vs. 19.5% of patients without LVI ($p<0.001$). When controlled for age, sex, t-stage, PNI, and margin status, presence of LVI was a significant predictor of the presence of cervical node metastasis (OR: 3.92, CI: 2.58-5.97, $p<0.001$). There was no significant association found between LVI and local recurrence (OR: 0.89, CI: 0.54-1.50, $p=0.68$), regional recurrence (OR: 1.36, CI: 0.77-2.39, $p=0.29$), or distant recurrence (OR: 1.32, CI: 0.76-2.31, $p=0.32$) when controlling for the other variables mentioned above.

Conclusion: The results of this study suggest that LVI is a significant predictor of the presence of cervical lymph node metastasis at presentation independent of other known prognostic factors such as positive main specimen margins and perineural invasion. In cases in which LVI is seen on final pathology after tumor excision but an elective neck dissection was not performed or neck irradiation not recommended, careful follow-up neck surveillance should be considered. LVI was not found to be a significant independent predictor of locoregional or distant recurrence, making its role limited in this regard, especially when other established recurrence risk factors such as PNI and positive margins are present.

A091: USE OF MACHINE LEARNING TO DEVELOP A CLINICAL PREDICTION MODEL FOR RECURRENCE IN EARLY ORAL CANCER

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Importance: Oral Cavity Squamous Cell Carcinoma (OCSCC) is a significant public health concern in the United States and globally. Predicting OCSCC recurrence using prediction modeling has been underutilized, and the development of a well-constructed model would augment ability to provide absolute risk estimates for individual patients. Machine learning (ML) has been increasingly used to develop prediction models in health care with promising results and may serve to improve our current methodology for model development.

Objective: To develop a prediction model for 2-year locoregional recurrence in patients with clinical T1-2N0 OCSCC based on clinical and pathologic data using a ML approach

Design, Setting, and Participants: Data from patients with clinical T1-2N0 OCSCC treated with primary surgical extirpation between 2000 and 2019 was collected from seven academic medical centers. This included patients who underwent elective neck dissections and those whose cervical lymph nodes were observed.

Main Outcomes: Primary endpoint was development and validation of predictive algorithms for 2-year locoregional recurrence.

Methods: Patient social, demographic, and clinical variables were collected. Histopathologic data from time of surgery was included in the analysis. The data was split into an 80/20 distribution for training and testing, respectively. Both bagging and boosting ensemble architectures were utilized to develop models predictive of 2-year locoregional recurrence. Tree-structured Parzen Estimator (TPE) approach was utilized to optimize hyperparameters. The data was scored using the test data set and discriminative ability was evaluated via area under the curve (AUC) of receiver operating characteristic (ROC) curve. Pairwise comparisons of model performance were performed, and the decision threshold for best performing model was optimized using the Youden index. Additional evaluative criteria included accuracy, precision, and recall. All models were developed in Python 3.7.10 using packages sklearn, hyperopt, and xgboost.

Results: From the cohort of 911 eligible OCSCC patients, 104 patients were excluded due to insufficient follow-up, and 251 were excluded due to missing clinical staging or survival information. The mean patient age was 60.5 years (SD= 13.9), 229 (53.8%) were male, and 518 (93.2%) were white. There were 117 reported recurrences and the 2-year locoregional recurrence rate was 21.0%. There were 45 local recurrences, 54 regional recurrences, and 18 cases with both local and regional recurrences. The median time to recurrence was 8 months (range 1 - 24 months). The ML model identified presence of nodal disease, tumor thickness, lymphovascular invasion, and perineural invasion as the most significant variables. When applied to the testing data (n=112), the calculated AUC of ROC was 0.71 (95% CI 0.59 to 0.84) and the accuracy was 67.9%.

Conclusions: Using ML, a recurrence prediction model for early OCSCC was created using socioeconomic, demographic, clinical, and pathological data. The developed prediction model demonstrated an overall robust performance and can be used as an aid to help guide patient counseling in the clinical setting. The results of this study also highlight the impact ML can have on improving our current methodologies in prediction modeling and personalizing care for patients with head and neck cancer.

POSTER LISTINGS

A092: PROGNOSTIC VALUE AND CLINICOPATHOLOGICAL STATUS OF PDL-1 EXPRESSION AND CD8+ TILS IN ORAL SQUAMOUS CELL CANCER PATIENTS WITH OR WITHOUT TRADITIONAL RISK

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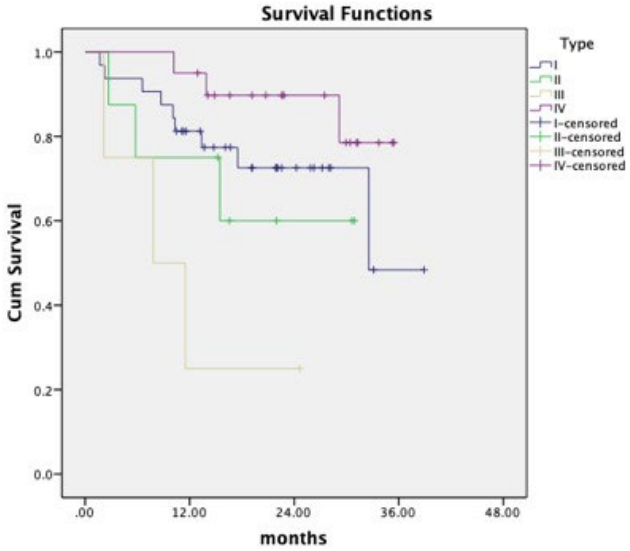
Background: Cigarette smoking, alcohol drinking, and betel nut chewing are traditional risk factors for oral squamous cell cancer (OSCC). Whilst, OSCC in non-smoker non-drinker and non-betel quid chewer (NSNDNB) has been reported to have lower survival outcome. Nonetheless, pathogenesis of NSNDNB patients with OSCC remains unclear. Interestingly, PD-L1 positivity is associated with poor prognosis. Whereas, an increase of CD8+ Tumor infiltrating lymphocytes (TILs) is related to better outcomes. There are 4 groups of tumor microenvironment based on PDL-1/TILs status. Host-cancer immune responses may also serve as pretreatment biomarkers from immune check-point blocking agents.

Objective: This study aimed to determine the impact of NSNDNB, as well as PD-L1 and CD8+ TILs on disease specific survival (DSS) in OSCC patients. The association of risk-exposure, PD-L1, CD8+ TILs, and clinicopathological outcome was also investigated.

Materials and Methods: Immunohistochemistry staining of formalin-fixed paraffin-embed tissue samples from 64 OSCC, including 16 of NSNDNB and 48 of smoker and/or drinker and/or betel quid chewer (SDB), was retrieved. The expression of PD-L1 was determined by using combine positive score (CPS), with CPS≥1 considered as positive. Whilst, CD8+ TILs were counted and defined as CD8-score 0 <1%, CD8-score 1 ≥1% and <5%, CD8-score 2 ≥5% and <10%, CD8-score 3 ≥10%. The status of PD-L1/CD8+TILs were stratified into 4 groups for type of tumor microenvironment.

Results: NSNDNB was related to female (p<0.001), T1-2 stage (p=0.021), and PD-L1 positivity (p=0.020). Of 64 patients, 36 (56.3%) were classified as positive for PD-L1 expression (13/16 NSNDNB vs 23/48 SDB). High density of CD8+ TILs was observed in 52 (81.3%) patients (15/16 NSNSDNB vs 37/48 SDB). Low density of CD8+ TILs was correlated to T4 (p=0.015) and perineural invasion (p=0.041). Multivariate analysis showed high density of CD8 in association with better disease specific survival (RR 0.45, 95%CI, 0.26-0.78, p=0.005), while PD-L1 positivity worse DSS (RR 3.07, 95%CI, 1.02-9.252, p=0.046). Regarding the 4 types of tumor microenvironment, type IV : immune tolerance (PD-L1 CPS negative/high CD8+ TILs) yielded highest DSS (85.0%), followed by type I : Adaptive immune resistance (PD-L1 CPS positive/high CD8+ TILs)(71.9%), type II : Immunological ignorance (PD-L1 CPS negative/low CD8+ TILs) (62.5%), and type III : Intrinsic induction (PD-L1 CPS positive/low CD8+ TILs)(25.0%).



Conclusion: NSNDNB is related to PD-L1 expression regardless of infiltration of CD8+ TILs. Nonetheless, there is no association of risk exposure with disease free survival. PD-L1 positivity yields worse disease survival outcome. Whereas, high density of CD8+ TILs is correlated to better survival, resulting in best prognosis of type IV tumor microenvironment.

Keywords: Oral squamous cell cancer, Non-smoker non-drinker and non-betel quid chewer, Smoker and/or drinker and/or betel quid chewer, PD-L1, CD8+ tumor-infiltrating lymphocytes

A093: SURVIVORSHIP OF ORAL CANCER BY SUBSITE DIFFERS IN YOUNG VERSUS OLD PATIENTS

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Background: Studies have demonstrated an increasing incidence of young patients with oral cavity squamous cell carcinoma (OCSCC). Moreover, large case series have suggested that a younger phenotype of OCSCC exhibits clinical differences in comparison with older patients. However, differences in the incidence and survival by anatomical subsite, stratified by age have not been studied on a national level. This study aims to evaluate the incidence and survival by subsite in young (<50 years old) and old (50+) OCSCC patients.

Study Design: Utilizing the Surveillance, Epidemiology, and End Results Program (SEER) Research Plus Data, 18 Registries November 2020 Submission data between 2004 and 2015 on patient demographics, clinicopathological features, and outcomes were recorded. Cox regression for survival analyses was performed to compare survival and incidence rates of OCSCC in 7 subsites (lip, oral tongue, buccal mucosa, alveolus, retromolar trigone, hard palate, and floor of mouth) stratified by age. Covariates in the analysis included stage and sex. Cause-specific mortality was the primary outcome.

Results: The study included 16,104 individuals, with 2,458 and 13,646 in the young and old groups, respectively. 35.8% were

female in the young group and 39.7% in the old group. The mean length of follow-up was 57.4 months (SD = 46.6). The older cohort demonstrated higher heterogeneity by SCC subsite compared to the young cohort (Table 1). By AJCC6 staging, selected for the largest sample size, 39.2% and 35.3% of patients in the young and old groups, respectively, presented with Stage I OCSCC.

For young patients, mortality from buccal mucosa SCC was higher (HR: 1.331, p = 0.022), but was lower in lip SCC (HR: 0.365, p = 0.026) when compared to oral tongue SCC. Young patients with hard palate SCC demonstrated a trend towards lower mortality (HR 0.583) compared to oral tongue (p=0.067) (Figure 1). For old patients, SCC of buccal mucosa (HR: 1.307, p < 0.001), floor of mouth (HR: 1.115, p = 0.003), hard palate (HR: 1.216, p = 0.006), and lip (HR: 0.462, p < 0.001) demonstrated significantly different overall survival relative to oral tongue (Figure 2).

Conclusion: This study is consistent with previous studies demonstrating oral tongue is the most common subsite among young patients. In both cohorts, buccal mucosa SCC confers the highest mortality risk. While in older patients, hard palate SCC is associated with higher mortality, this trend does not translate to the young patient cohort. Further studies are needed to elucidate why such differences are present between older and younger patients. However, this study demonstrates that a more accurate prognosis could be obtained when accounting for age and subsite of oral cavity SCC.

		Young	Young (%)	Old	Old (%)	Total
Sex	*Female*	879	35.76	5412	39.66	**6291**
	Male	1579	64.24	8234	60.34	**9813**
Site	*Alveolus*	158	6.43	2159	15.82	**2317**
	Buccal Mucosa	173	7.04	1156	8.47	**1329**
	FOM	415	16.88	3128	22.92	**3543**
	Hard Palate	46	1.87	466	3.41	**512**
	Lip	82	3.34	446	3.27	**528**
	RMT	108	4.39	1024	7.50	**1132**
	Tongue	1476	60.05	5267	38.60	**6743**
AJCC 6 Staging	*I*	963	39.18	4822	35.34	**5785**
	II	364	14.81	2326	17.05	**2690**
	III	353	14.36	1904	13.95	**2257**
	IVA	647	26.32	3662	26.84	**4309**
	IVB	59	2.40	381	2.79	**440**
	IVC	37	1.51	313	2.29	**350**
	IVNOS	35	1.42	238	1.74	**273**
Total		**2458**		**13646**		**16104**

Table 1.

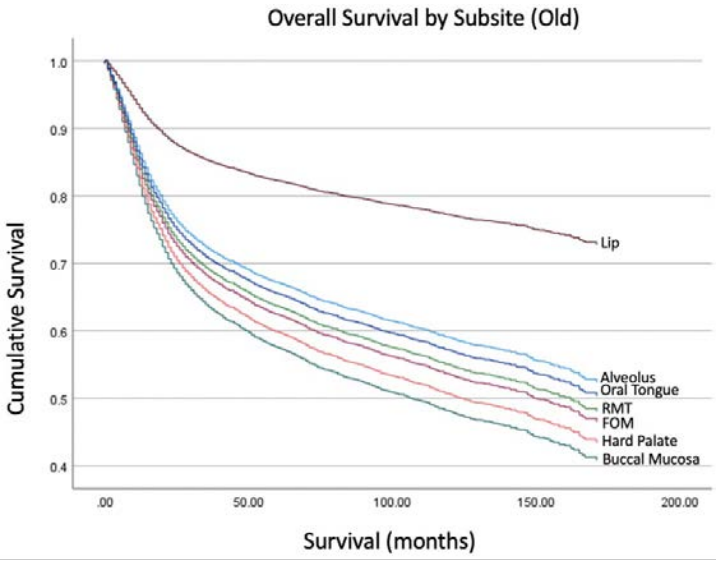

Figure 1.

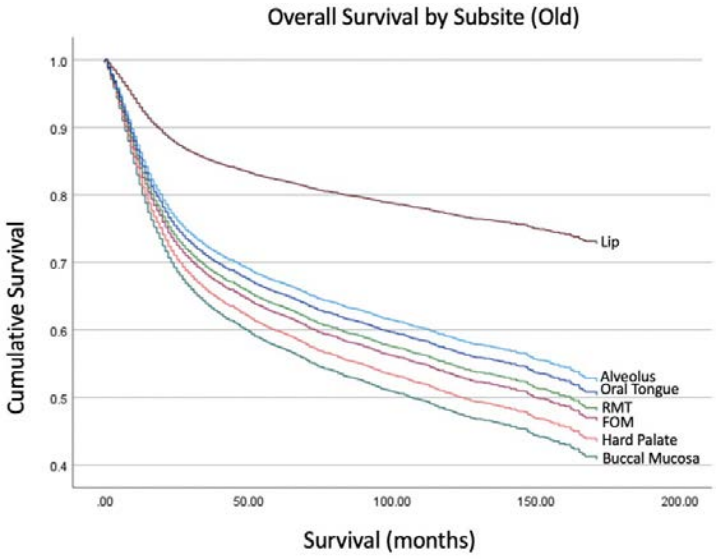

Figure 2.

A094: USING MACHINE LEARNING TO PREDICT DISEASE FREE-SURVIVAL IN ORAL CAVITY CANCER

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Objectives: To enhance prediction of disease free-survival (DFS) among patients with oral squamous cell carcinoma (OSCC) using machine learning methods.

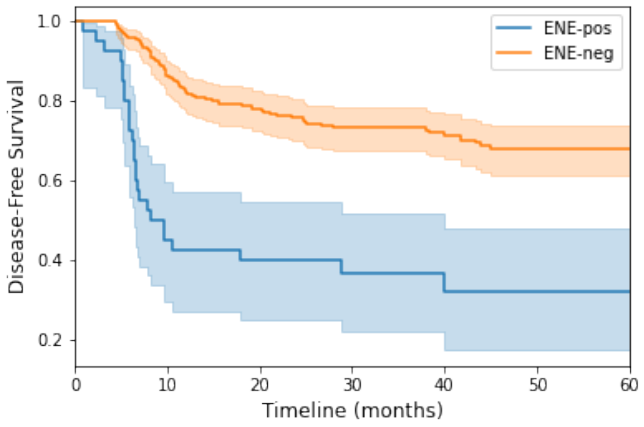
Methods: Patients diagnosed with OSCC from 2013-2018 across five hospitals in the Yale Health system were identified from the

tumor registry. Altogether our cohort included 300 subjects with known recurrence status and a minimum of 2-years of follow-up after diagnosis or earlier recurrence observed. Subjects were classified into 6-month periods of time to recurrence with patients absent of recurrence designated separately. Machine learning methods including an artificial neural network (ANN) were trained on a randomly subsetted 80% cohort of the dataset. Cox-proportional hazard regression was used to evaluate significant contributors of DFS.

Results: In total, our cohort included 81 locoregional, 17 distant, and 5 unspecified occurrences of oncologic recurrence. The median contact duration was 44 months (IQR: 32-57) for non-recurrent patients and 25 months (15-38) for recurrent patients. Using an ANN comprised of 3 hidden layers, 25 clinicopathological inputs and a multiclass output of 9 periods, the model achieved an accuracy of 73.8% (SD: 7.4%). ANN-based regression outperformed other models and achieved a mean absolute error (MAE) of 1.63 (SD: 0.41), compared to linear regression (MAE: 1.99, SD 0.16) and random forest regressor (MAE: 2.00, SD: 0.16) models. Cox-proportional hazard regression revealed significant relationships with age, insurance status, anatomic site, ENE, and positive lymph node burden.

Conclusion: Machine learning methods can enhance our prediction of tumor recurrence for informing clinical prognostication and guiding oncologic management.

Figure 1: Disease-Free Survival by ENE status in Study Cohort



A095: MULTIFUNCTIONAL TARGETED NANO-SCAFFOLD FOR TREATMENT OF CHEMOTHERAPY INDUCED ORAL MUCOSITIS

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Introduction Oral Mucositis is a common and often debilitating side effect of chemotherapy. The damage to the mucosal lining of the oral cavity may result in painful ulcers, impairing nutritional uptake and quality of life. The ulcers often require systemic opioid analgesics or topical analgesic mouthwash. However, the pain associated with the ulcers may impair the patient's oral intake of medication, and the relief from mouthwash is short lived. Therefore, developing new strategies to treat oral mucositis is critical to reduce pain and improve oral intake.

Methods We developed a multifunctional targeted nano-scaffold for treatment of mucosal lesions; Collagen IV targeted Poly Lactic-co-Glycolic Acid (PLGA) Polyethylene glycol (PEG) nanoparticles loaded with anti-inflammatory drug and decorated with free amine groups were topically applied to the buccal membrane of a mouse with oral mucositis. The particles adhered to the basement membrane that was exposed as the ulcers formed. The oral cavity was then treated with an analgesic drug conjugated to biodegradable oxidized polysaccharide. The immediate interaction between the nanoparticles and the polysaccharide formed a long acting analgesic scaffold over the lesion. The platform was tested in vitro and in vivo. The well-being of treated mice in vivo was documented daily using a scoring system that incorporated oral intake, hydration, level of activity, general posture, weight loss and presence of oral lesion.

Results The nanoparticles and the scaffold were tested in vitro and shown to be safe and effective. Mice treated with a combination of nanoparticles and oxidized polysaccharide were found to have less severe weight loss and a better well-being score compared to the control groups. We report that topical application of nanoparticles once every three days was as effective as applying the particles daily. This is due to prolonged retention of targeted nanoparticles in the oral cavity of mice with oral mucositis, and slow release of both anti-inflammatory and analgesic drugs.

Conclusions We report a novel and safe muco-penetrating delivering platform to treat oral mucositis. The targeted scaffold may protect the lesions from the hostile oral environment by forming a temporary barrier, while delivering drugs directly to the lesions. This approach may be further utilized to treat other mucosal lesions with different drug loads.

A096: IMPLEMENTATION OF MACHINE LEARNING CLASSIFIERS TO PREDICT 5-YEAR OVERALL SURVIVAL FOR ORAL CAVITY CANCER USING NCDB

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Objectives: To develop a machine learning-based classifier that better assesses 5-year overall survival (OS) for patients with oral squamous cell carcinoma (OSCC) compared to prognostic predictions by AJCC staging.

Methods: The clinicopathologic characteristics, treatment, and outcome information for patients with OSCC from the National Cancer Database (NCDB) between 2004-2016 were obtained. Patients were excluded for missing staging information or T0 disease, yielding 79,383 patients. An 80:20 split was applied in a randomized manner to generate training and testing datasets. Various machine learning models including artificial neural networks (ANNs) were trained on normalized, numerically encoded parameters. The performance of the machine learning model was compared to nationally reported 5-year OS rates using the 8th edition of the AJCC staging system.

Results: The best performing model involved an ANN with 5 hidden layers, 23 clinicopathologic inputs, and a binary output that encoded 5-year survival status. The model achieved an accuracy of 86.68% with an Area Under the Curve (AUC) of 93.2% for predicting 5-year OS, ranging from 92.9%-93.8% across each

of the 4 stages. The model also outperformed other models and classifiers found in the literature across other metrics, including positive predictive value (94.2%), sensitivity (79.8%), and F1 score (86.4%). The ANN exceeded performance using prognosis based on AJCC staging prognosis as reported across various sources in the literature, yielding AUC from 46.0%-53.0% across each of the 4 stages.

Conclusion: Machine learning classifiers offer valuable tools to improve prognostic capacity for determining overall survival in OSCC.

Figure 1: Receiver operating characteristic (ROC) across each AJCC stage

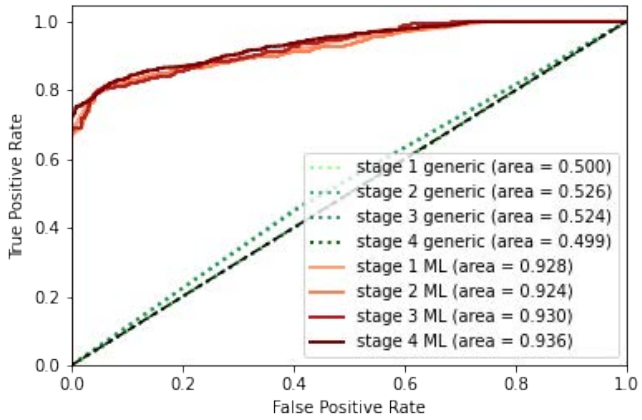
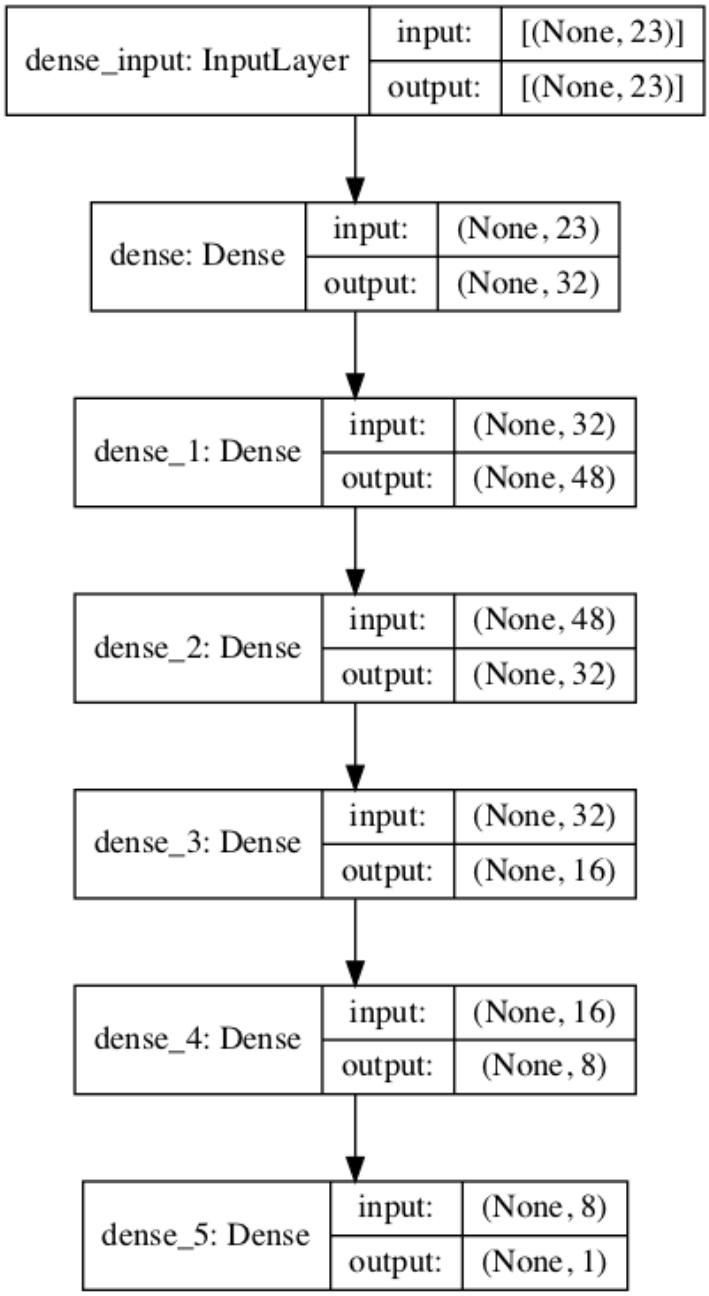


Figure 2: Architecture of artificial neural network (ANN)



A097: TORS WITH NECK DISSECTION VERSUS PRIMARY NON-SURGICAL TREATMENT IN STAGE I AND II HPV-NEGATIVE OROPHARYNGEAL CANCER

Brian Morris, MD[1]; Craig A Bollig, MD[2]; [1]Penn State College of Medicine; [2]Rutgers Robert Wood Johnson Medical School

Importance: The use of advanced, minimally invasive transoral surgical techniques for oropharyngeal cancer (OPC) have been increasing for early stage (T1 and T2) disease. Transoral robotic surgery (TORS), in particular, has become widely adopted at many centers nationally, predominantly for HPV positive OPC. Comparatively less information is available in HPV-negative OPC. Recently, treatment escalation with surgery + adjuvant therapy was shown to have superior survival versus primary non-surgical

treatment in T1-2, N1-2b HPV-negative OPC. However, there is a paucity of information on comparative outcomes of TORS versus non-surgical treatment in early stage tumors without clinical evidence of nodal disease.

Objective: The aim of this study was to perform a national analysis of TORS with neck dissection versus primary non-surgical treatment for T1-2 N0 HPV-negative OPC using a large national database.

Design: Retrospective analysis of patients with T1-2 N0 M0 HPV-negative OPC in the National Cancer Database (NCDB) stratified by treatment status: 1) TORS with neck dissection +/- adjuvant therapy 2) Primary Radiation Therapy (>60 Gray) +/- chemotherapy.

Main Outcome and Measure: Baseline patient variables were compared between groups using univariate tests. Predictors of TORS were identified using logistic regression. Overall survival (OS) was compared between groups using Kaplan-Meier method with the log-rank test as well as multivariable Cox proportional hazards models to adjust for confounders.

Results: There were 848 patients remaining after exclusions, 665 (78.4%) patients in the primary non-surgical group and 183 (21.6%) patients in the TORS group. Clinical predictors of TORS included: treatment at an academic institution (Odds Ratio [OR]: 7.72, 95% Confidence Interval [CI]: 5.00-11.93), tonsil primary site (OR: 2.70, 95% CI: 1.70-4.29), stage T1 (OR: 3.23, 95% CI: 2.20-4.72). Adjusting for age, comorbidity score, facility type, tumor subsite, and tumor stage; primary non-surgical treatment was associated with worse OS (Hazard Ratio [HR]: 1.90, 95% CI 1.34-2.69).

Conclusions and Relevance: For T1-2 N0 HPV-negative OPC, TORS with neck dissection is associated with a survival benefit over non-surgical treatment. Given the lack of available prospective data, TORS should be strongly considered for appropriate candidates.

A098: DETERMINANTS OF PATIENT-REPORTED TASTE PROBLEMS IN OROPHARYNGEAL CANCER SURVIVORS

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Background: Human papillomavirus and improvements in cancer therapy have contributed to a growing population of younger oropharyngeal cancer (OPC) survivors at risk of experiencing treatment-related adverse effects including taste problems. OPC patients experience both acute and chronic taste disorders with varying degrees of hypergeusia, dysgeusia, ageusia, and taste phantoms. These changes can negatively impact quality of life (QOL) and contribute to a decline in nutritional status and medication adherence. Factors associated with such taste disorders specific to OPC are not well characterized. The goal of this study was to investigate clinico-demographic risk factors associated with moderate to severe taste problems in long-term OPC survivors.

Methods: The study population included OPC survivors treated curatively at MD Anderson Cancer Center between January 2000 and December 2013 who responded to a cross-sectional survivorship survey. Taste symptoms were measured using a single item on the multi-symptom MD Anderson Symptom Inventory Head and Neck Cancer module (MDASI-HN). The MDASI-HN rates patient symptoms on a 0 (not present) to 10 (as bad as you can imagine) scale. Our primary outcome variable was patient-rated taste problems using the MDASI-HN, specifically dichotomized as moderate to severe (score ≥5) or none to mild (score <4). Descriptive statistics and multivariable logistic regression analysis were conducted to identify risk factors associated with moderate to severe taste problems.

Results: This study included 873 OPC survivors with a median survival time of 6.0 years (range 1-16 years). 142 (16.3%) reported moderate to severe taste problems and 731 (83.7%) reported none to mild taste problems. On multivariable analysis, age at diagnosis (OR 1.05; 95% CI, 1.02-1.07) and continued smoking at time of survey (OR 2.32; 95% CI: 1.00-5.39) were associated with increased risk, while a greater than high school education (OR 0.56; 95% CI, 0.35-0.92) and neck dissection (OR 0.37; 95% CI, 0.20-0.65) were associated with lower risk of moderate to severe taste problems.

Conclusion: In this large survivorship study, 1 out of 6 OPC survivors reported moderate to severe taste problems persisting years after treatment, with several factors associated with either increased or decreased risk. These results will inform prospective counseling by clinicians and future research into potential mechanisms underlying these associations as well as supportive care interventions to improve taste function and taste related QOL in OPC survivors.

A099: DIFFERENCES IN SURVIVAL OF OROPHARYNGEAL SQUAMOUS CELL CARCINOMA BY SUBSITE AND HPV STATUS

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Introduction: Human Papilloma Virus (HPV) is a well-studied risk-factor for the development of oropharyngeal squamous cell carcinoma (OPSCC). Although the HPV(+) OPSCC is known to have better prognosis than HPV(-) OPSCC, the impact on individual subsites remains undefined. This study aimed to characterize OPSCC survival stratified by HPV and oropharyngeal subsite.

Methods: National Cancer Data Base (NCDB) data was reviewed from 2004 to 2017. Subsites included base of tongue (BoT), tonsillar complex (TC), lateral and posterior oropharyngeal walls (LPOW), soft palate (SP), valleculae and anterior surface of the epiglottis (VE), and unspecified or overlapping (Other). Multivariate Cox Regressions were conducted with the following covariates: age (cutoff median of 60 years), sex, race, tumor grade, extracapsular extension, lymphovascular invasion, and AJCC pathologic TNM staging. Multivariate analyses were presented as hazard ratio [95% confidence interval]. Log Rank (Mantel-Cox) was

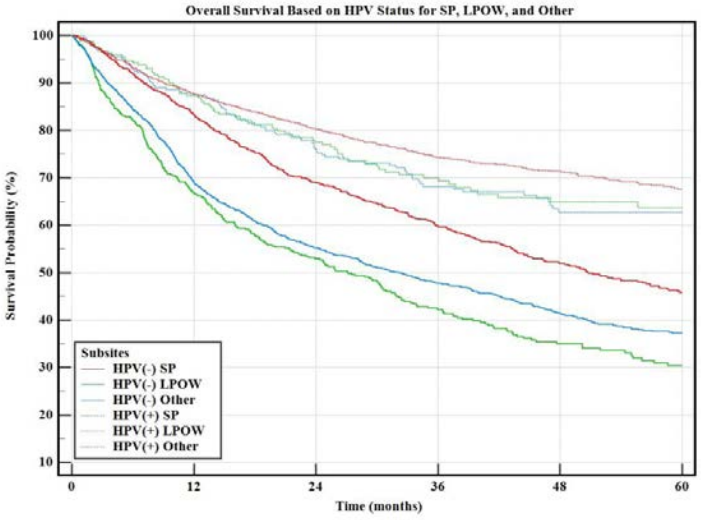
used to compare overall survival at 2 years (2yOS) and 5 years (5yOS) between HPV status and oropharyngeal subsites.

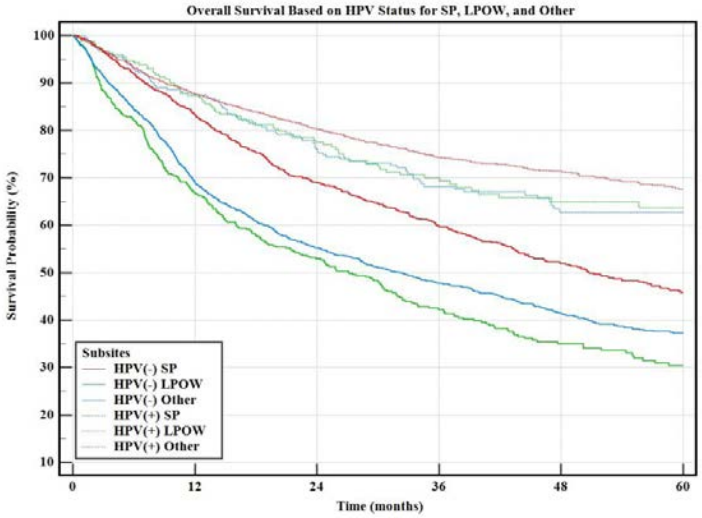
Results: A total *N* of 58,712 patients had OPSCC with 39,624 HPV(+) patients and 19,088 HPV(-). When analyzed by subsite *N* (HPV(-):HPV(+)), there were BoT 22,520 (7304:15216), TC 28,822 (7526:21285), LPOW 872 (583:289), SP 1,630 (1286:344), VE 695 (412:283), and Other 4,184 (1977:2207). Multivariate analysis showed worse survival for older age (1.53[1.36,1.72]), lymphovascular invasion (1.53[1.35,1.73]), extracapsular extension (1.77[1.54,2.02]), higher pT staging, (T2 1.53[1.32,1.77], T3 3.01[2.53,3.60], T4 3.95[3.26,4.79]), and presence of metastases staging (3.72[2.13,6.50]). Overall survival for HPV(-) OPSCC was worse for BoT when compared to TC ($p<0.001$), although weaker differences in 2yOS and 5yOS was seen for HPV(+). HPV(+) OPSCC had better survival than HPV(-) OPSCC for all subsites, including BoT, TC, LPOW, SP, VE, and Other ($p<0.001$).

Conclusions: Survival for OPSCC differs not only by HPV status, but also by oropharyngeal subsites. Survival was worse for BoT when compared to tonsil for HPV(-) OPSCC, but survival only differed mildly between these subsites for HPV(+) OPSCC. SP and LPOW showed the worst 5yOS with a significant difference in HPV(+) tumors. In contrast, a larger difference in 2yOS and 5yOS was noted between these subsites for HPV(-) OPSCC. Overall survival between BoT and VE are similar for HPV(-), but not HPV(+). The findings show that OPSCC of each subsite is characterized by different prognoses, and HPV affects survival differently between subsites of the oropharynx. Future directions include examining survival differences for each subsite stratified by patient characteristics (e.g., tobacco exposure) and impact of treatment modalities.

OPSCC Percent Survival at 2- and 5- Years

Oropharyngeal Subsite	2-Year Overall Survival (2yOS) %		5-Year Overall Survival (5yOS) %	
	HPV (+)	HPV (-)	HPV (+)	HPV (-)
Base of Tongue (BoT)	88.0	64.6	76.7	50.5
Tonsillar Complex (TC)	90.3	72.2	80.6	57.4
Lateral and Posterior Oropharyngeal Walls (LPOW)	77.3	52.8	63.2	30.2
Soft Palate (SP)	76.2	68.9	63.0	46.1
Valleculae & Anterior surface of epiglottis (VE)	81.0	65.1	66.2	46.1
Unspecified or overlapping (Other)	80.3	55.3	67.5	37.3





A100: HPV IN THE CERVIX AND OROPHARYNX: ASSESSING THE PREVALENCE OF GYNECOLOGIC CANCER AND PRECANCEROUS LESIONS IN WOMEN WITH OROPHARYNEAL CANCER

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Objectives: The aims of this report are to (1) synthesize the existing literature on epidemiologic associations between HPV+ gyncologic and oropharyngeal cancer and (2) describe the prevalence of cervical, vulvar, and vaginal cancer or dysplasia in patients with oropharyngeal squamous cell carcinoma (OPSCC) treated with primary transoral robotic surgery (TORS).

Study Design: Literature review and case series.

Methods: Chart review was conducted on female patients with HPV+ OPSCC receiving primary TORS at an academic medical center from March 2007 to March 2021, with a minimum of one year follow-up. Data collected included demographics, past medical and surgical history, treatment, survival, and recurrence, if applicable. Data was analyzed with descriptive statistics and Kaplan-Meier analysis.

Results: Out of 92 women patients, 8.7% (8/92) had a history of an HPV-positive gynecologic precancerous or cancerous lesion, including 2 with cervical cancer, 3 with cervical dysplasia, 2 with vulvar cancer, and 1 with vaginal dysplasia. In addition, 17 women had a history of hysterectomy without documented evidence of gynecologic (pre)cancerous lesions and were excluded. The median age for patients with a history of an HPV-positive gynecologic lesion was 54 years (IQR: 53-70). All 8 women were surgically treated for their gynecologic disease and were disease-free at time of primary surgery for OPSCC. Pathological stage for OPSCC were stage III (5), IVa (2), and IVb (1).Treatment failure was reported in 2 out of 8 women, with one case of locoregional recurrence and one of distant recurrence. No difference in overall survival was noted between women with or without a history of an HPV-positive gynecologic (pre)cancerous lesion ($p = 0.25$).

Conclusions: A history of gynecologic cancer or dysplasia can be frequently found in women with HPV+ OPSCC. Further study of this subgroup of patients with oropharyngeal and cervical co-infection may elucidate mechanisms of HPV susceptibility.

POSTER LISTINGS

A101: EVALUATING PREDICTORS OF FINANCIAL TOXICITY IN HEAD AND NECK CANCER PATIENTS TREATED WITH TRANSORAL ROBOTIC SURGERY

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Background: Patients with HPV-associated (HPV+) oropharyngeal squamous cell carcinoma (OPSCC) are younger and have better prognosis, leading to an increased focus on adverse treatment effects. One underrecognized adverse effect is financial toxicity (FT), understood as the patient-level impact of the costs of cancer care.

Objectives: To test our hypothesis that there are identifiable risk-factors for FT in HPV+ OPSCC we aimed to 1) examine the prevalence of FT in patients receiving primary transoral robotic surgery (TORS) and 2) identify patient and treatment-level predictors for worse FT.

Study Design: Single-site, cross-sectional cohort survey study.

Methods: Eligible patients were ≥18 years who received primary TORS for HPV+ OPSCC between March 2007-March 2021. A survey including financial and insurance status, swallowing function [MD Anderson Dysphagia Inventory (MDADI), 20 (extremely low functioning)–100 (high functioning); Functional Oral Intake Scale (FOIS), 1 (no oral intake)–7 (total oral diet)], and subjective financial toxicity [Comprehensive Score for Financial Toxicity (COST), 0 (worse toxicity)–44 (less toxicity)] was sent to participants. A retrospective chart review was conducted to collect demographics, treatment information, and survival outcomes.

Results: A cohort of 120 cancer survivors were included [response rate 12.9%, male 89% (n = 107) median age 60 (IQR = 54-64)]. Median time between treatment and survey completion was 5.24 years (IQR = 3.46-7.27). There were no differences by sex, age, race, insurance class, or type of adjuvant treatment between the response and non-response cohorts. In the study cohort, 41% (n = 49) reported a COST score £ 25, representing high FT. There were significant differences in COST scores by race and income. Reported FT was worse in non-white compared to white patients [10 (95% CI: 4-17) vs. 29 (27-31), p < 0.001] and for those with lower annual income at time of surgery [< $40,000, 20 (14-27) vs. $40,000-79,000, 23 (20-27) vs. $80,000-150,000, 31 (28-34) vs. > $150,000, 34 (31-37), p < 0.001]. These factors also demonstrated significant associations on multiple linear regression (p < 0.001). Treatment factors associated with worse FT included free flap reconstruction [25 (19-30) vs. 31 (28-34), p = 0.022], and adjuvant treatment modality [surgery only, 36 (32-39) vs. adjuvant radiation, 28 (25-32) vs. adjuvant chemoradiation, 27 (22-32), p = 0.015]. At time of survey completion, worse FT was also significantly associated with patient-reported swallowing outcomes, including impaired functional oral intake [26 (23-28) vs. 31 (28-33), p = 0.007], and moderate/severe dysphagia on composite MDADI [23 (19-27) vs. 30 (27-32), p = 0.002]. On multiple linear regression, composite MDADI but not impaired functional oral intake remained an independent predictor of FT when controlling for race, income, and time from surgery date. Factors not associated with COST included late tumor stage (pT3/4), time from surgery date, government-sponsored insurance, lack of full-time employment at surgery date, and loss of full-time employment following surgery.

Conclusions: Income, race, adjuvant treatment modality, and long-term patient-reported swallowing outcomes are associated with FT. There is an increasing need for healthcare providers to understand and develop strategies to identify and assist at-risk patients.

A102: TREATMENT TRENDS AMONG HEAD AND NECK SQUAMOUS CELL CARCINOMA IN THE UNITED STATES

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Background: Recent decades exhibit a changing landscape of head and neck squamous cell carcinoma (HSNCC) and its treatment. The landmark Department of Veteran's Affairs trial, the appreciation of the role of human papillomavirus in HNSCC epidemiology and prognosis, adoption of robotic techniques in transoral surgery, and the improvements in radiation therapy techniques underlie the most prominent shifts. Trends in surgical and non-surgical primary curative treatment for HNSCC over this time period, however, have not been described.

Methods: This is a retrospective cohort study of incident cases of HNSCC from 2004-2017 included in the National Cancer Database, a hospital-based cancer registry in the United States. Incident cases of HNSCC from 2004-2017 with available treatment data who received either radiation or surgical treatment with curative intent were included. The association of primary radiation therapy rather than primary surgical therapy was examined across demographic and disease data by chi-squared tests and multivariable logistic regression. Trends over time were described using linear regression (annual percent change, APC) and compared using nonparametric tests for trend.

Results: Of 310,633 HNSCC cases in the dataset, 37.6% received primary surgical therapy whereas 62.4% received radiation therapy. After adjustment, receipt of radiation was significantly associated with nonacademic treatment facility (aOR=2.33, 95%CI 2.27-2.38), closer distance to treatment facility (aOR=1.85, 95%CI 1.82-1.92), node-positive disease (aOR=2.18, 95%CI 2.14-2.23), and oropharynx, larynx, hypopharynx, or nasopharynx primary site, among other factors.

Among HNSCC from 2004-2017, there was an increase in primary surgical therapy (APC=0.6 [95% CI 0.6-0.7] per year), which persisted after adjustment (aAPC=1.0 [95% CI 1.0-1.1]). This trend was limited to non-oropharyngeal cancers (aAPC=1.1 [95% CI 1.1-1.2]), as treatment patterns remained stable for oropharyngeal cancers. When the analysis was limited to oropharyngeal cancers with available HPV tumor status (2010-2017 only), the proportion of cases treated with primary radiation therapy increased for both HPV-positive and HPV-negative tumors over time. This trend was more significant for HPV-positive tumors (aAPC=1.1 [95%CI 0.8-1.3] versus 0.3 [95%CI 0.0-0.5%=], p<0.001).

Conclusion: Though the proportion of HNSCC cases treated with primary curative surgical therapy increased since 2004, treatment for oropharyngeal cancers has trended toward radiation in recent calendar years. The rate of primary curative radiation therapy increased for all oropharyngeal cancers from 2010-2017, a trend which is significantly more pronounced for those with HPV positive tumor status. These nationwide trends contextualize current treatment decisions and inform ongoing paradigm shifts about treatment deintensification for oropharyngeal cancers with low risk of recurrence.

POSTER LISTINGS

A103: VALIDATION OF AJCC-8 FOR OROPHARYNGEAL SQUAMOUS CELL CARCINOMA IN APPALACHIANS WITH MULTIPLE CONFOUNDERS

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Background: In contrast to the American Joint Committee on Cancer's 7th edition staging criteria (AJCC-7), the 8th edition (AJCC-8) separates oropharyngeal squamous cell carcinomas (OPSCCs) into human papillomavirus-positive (HPV+) tumors and HPV-negative (HPV-) tumors. While AJCC-8 offers better predictions for overall survival, various factors may modulate survival and patient outcomes.

Objectives: To validate the AJCC-8 as a better metric of survivability over AJCC-7 and confirm AJCC-8 applicability among possible confounding variables common in Appalachia and other regions.

Study design: Retrospective chart review at an academic tertiary care institution from 2010 to 2020.

Methods: With IRB approval, a cohort of 1621 patients were obtained from medical records of patients admitted to the University of Kentucky healthcare system. 479 patients met the inclusion criteria consisting of an oropharyngeal primary with known p16 immunohistochemistry status. Other data collected included demographics, insurance information, rurality, Appalachian status, Charlson Comorbidity Indices (CCI), recurrence, metastases, and mortality data. A Cox proportional hazard regression and multivariate logistic regression were performed.

Results: Within this cohort, the incidence of HPV+ and HPV- OPSCC was 377 (78.7%) and 102 (21.3%), respectively. AJCC-8 had a higher odds of predicting mortality of stage IV HPV+ OPSCCs compared to stages I - III (OR = 5.04, 95%CI: 1.98 - 14.12; p < 0.001) compared to AJCC-7 (OR = 1.41, 95%CI: 0.72 - 2.87; p = 0.32). Additionally, AJCC-8 appropriately stratified all stages of HPV+ OPSCC in a survival analysis (p < 0.001). AJCC-7 exhibited significant overlapping of the survival curves. Multivariate analysis demonstrated several factors that could have confounded the accuracy of AJCC-8. Extranodal extension (ENE) is associated with higher staging for HPV- OPSCCs under AJCC-8; it does not alter HPV+ staging. However, HPV+ OPSCCs with ENE had a higher odds of overall mortality (OR = 1.79, 95%CI: 1.11 - 2.90; p = 0.02) compared to HPV+ OPSCCs without ENE. Additionally, patients in this cohort demonstrate numerous additional comorbidities that may alter OS. HPV+ OPSCC patients with a CCI greater than or equal to 3 had a higher odds of mortality (OR = 1.80, 95%CI: 1.12 - 2.93; p = 0.02) compared to those with a score less than 3. Patients with HPV+ OPSCCs with Medicaid or self-pay-status had higher odds of overall mortality (OR = 1.62, 95%CI; 1.06 - 2.47; p = 0.03) compared to those with private insurance or Medicare. Finally, HPV+ patients from rural populations had a higher odds of presenting with stage IV OPSCC (OR = 2.68, 95%CI: 1.03 - 7.17; p = 0.04). Within this cohort, 32% of patients diagnosed with OPSCC were from rural populations.

Conclusions/Relevance: AJCC-8 provides enhanced guidelines for staging OPSCCs based on p16 status. However, confounding variables may influence AJCC-8's ability to accurately stratify patients into stages and predict overall survival. These results validate the improvements of AJCC-8 over AJCC-7 and confirm AJCC-8's staging capabilities in the context of a population with statistically significant confounding variables.

A104: SURGERY FOR THE TREATMENT OF HPV-NEGATIVE SQUAMOUS CELL CARCINOMA OF THE OROPHARYNX - A SYSTEMATIC REVIEW AND META-ANALYSIS.

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Background: Human papillomavirus (HPV) negative oropharyngeal squamous cell carcinoma (OPSCC) is associated with worse survival when compared to HPV positive. Primary surgery is one option to intensify therapy in this high-risk group of patients. Unfortunately, the only randomized trial to explore this approach (RTOG 1221) failed to accrue and the role of primary surgery in the treatment of HPV-negative OPSCC remains unanswered.

Methods: A systematic review and meta-analysis were performed to examine the outcomes of surgery in the treatment of HPV-negative OPSCC. We used the PRISMA statement for reporting and queried Pubmed, Web of Science and the Cochrane databases for studies examining the use of primary surgery in the treatment of HPV-negative OPSCC. Excluded from analysis were reviews, commentaries, case series with fewer than 10 patients, and studies that included HPV-negative head and neck cancers of mixed sites. Our primary outcomes were 2-year and 5-year overall survival (OS) and disease-free survival (DFS). OS and DFS were pooled using meta-analysis of proportions.

Results: Twelve studies including a total of 1,447 patients were identified. Overall, 1,101 patients (76%) had small primary tumors (T1-T2) and 253 (24%) large primary tumors (T3-T4). Most patients included in the analysis 787 (54%) were treated with primary surgery: 576 transoral and 211 open. The average rate of positive margins was 16.45% (SD=14.72%). The average rate of patients who underwent risk stratified adjuvant therapy was 64.95%. The rate of patients who underwent adjuvant radiation therapy was 37.48% and adjuvant chemoradiation therapy was 27.47%. The average follow-up was 32.7 months (SD=12.47 months). Pooled two-year and five-year OS for patients undergoing any surgery was 88% (95% CI 81-94%, I2=65%; 6 studies) and 70% (95% CI 30-97%, I2=96%; 3 studies), respectively. Pooled two-year and five-year DFS for patients undergoing any surgery was 77% (95% CI 66-86%, I2=55%; 6 studies) and 59% (95% CI 50-69%, I2=0%; 3 studies), respectively. Pooled two-year and five-year OS for patients undergoing transoral surgery was 92% (95% CI 88-96%, I2=20%; 5 studies) and 87% (95% CI 79-94%, I2=undetermined; 2 studies), respectively. Pooled two-year and five-year DFS for patients undergoing transoral surgery was 78% (95% CI 63-90%, I2=56%; 4 studies) and 59% (95% CI 47-71%, I2=undetermined; 2 studies), respectively.

Conclusions: The two- and five-year OS for patients with HPV-negative OPSCC treated with any surgical approach and pathology-directed adjuvant therapy is 88% and 70%, respectively. The two-year and five-year OS for HPV-negative OPCSCC treated with trans oral surgery and pathology-directed adjuvant therapy is 92% and 87%, respectively.

POSTER LISTINGS

A105: INTERDISCIPLINARY WORKSHOP THAT IMPROVES HPV-MEDIATED OROPHARYNGEAL CANCER KNOWLEDGE AMONG PRIMARY CARE RESIDENTS

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Background: Awareness of the role of HPV in the development of oropharyngeal squamous cell carcinoma (OPSCC) continues to be low among students, trainees, and clinical providers across specialties. We have developed a virtual HPV educational workshop that in pilot groups has been shown to successfully and significantly improve awareness of head and neck manifestations and sequelae of HPV infections. The objective of this study is to validate the efficacy of this virtual, interdisciplinary workshop in improving HPV knowledge and vaccination practices among providers.

Methods: A virtual platform was utilized to hold HPV educational workshops with dental students, pediatric dental residents, and primary care trainees (residents in pediatrics, family medicine, and the internal medicine department's primary care track) across Southern California and Southern Nevada. Online surveys were distributed immediately before, and 1-2 weeks after the 1-hour interactive, virtual HPV workshop, which was led by otolaryngology residents. Surveys included specific questions to assess the workshop's impact on: (a) improving knowledge of the role of HPV in OPSCC, and (b) changing provider vaccination practices. The vaccination rates of the internal medicine residents were recorded from 2016 to 2021, including data from before and after attendance at the workshop.

Results: Nine HPV workshops were held (total > 80 trainees), who responded to the pre-course survey: 67% were fully HPV vaccinated, 68% were female, and 43% were >30 years old. After the workshop, participants demonstrated significantly improved scores relating to knowledge of the most common HPV cancers ($p=0.003$) and expressed increased comfort with counseling patients on HPV vaccination ($p=0.002$). Respondents were also more aware that the HPV vaccine is approved to prevent OPSCC (61% vs. 95%, $p<0.05$). 97.2% of respondents stated that the workshop changed their HPV vaccination practices, and 95.5% of those not fully vaccinated stated they would now be more likely to receive the vaccine themselves. There was a significant increase in the average number of HPV vaccines administered at internal medicine clinics per month from 16.8 vaccines/month to 37.6 vaccines/month (percent increase = 123%) in the five months following the workshop ($p=0.002$). The quarter immediately following the workshop yielded the highest number of HPV vaccines given in a single quarter from all available data dating back to 2016. During this time period, the number of administered TDAP, influenza, and meningococcal vaccines remained relatively unchanged.

Conclusions: Our interactive virtual workshop has shown great efficacy in improving HPV knowledge and vaccination practices among providers. This course fosters an interprofessional understanding of the role of HPV in OPSCC and subsequently strengthens recommendations for HPV vaccination. The "virtual platform" underlying this course naturally allows it to serve as a pilot for larger, multi-institutional international partnerships to facilitate knowledge transfer regarding medical education and vaccination efforts all across the globe.

A106: IMPROVING MARGIN ASSESSMENT DURING TRANSORAL ROBOTIC SURGERY FOR P16+ OROPHARYNGEAL SQUAMOUS CELL CARCINOMA WITH UTILIZATION OF INTRAOPERATIVE POSITIVE CONTROLS

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Objectives: The purpose of this study was to ascertain rates and clinical features predictive of non-diagnostic intraoperative frozen margins in patients undergoing transoral robotic surgical (TORS) for p16+ oropharyngeal squamous cell carcinoma (OPSCC). Additionally, we aimed to determine the effects of using intraoperative positive controls on the accuracy of frozen margin sampling and the subsequent impact on use of operating room resources.

Hypothesis: Our hypothesis was that the use of an intraoperative positive control would further aid pathologists in determining frozen margin status thereby resulting in shorter procedure times.

Study Design: Retrospective cohort review

Methods: All patients receiving curative-intent TORS for biopsy-proven p16+ OPSCC performed by a single attending surgeon from 2017 to 2021 were included. Exclusion criteria included HPV-negative status, participation in a clinical trial of neoadjuvant chemoradiotherapy, and tumors of unknown primary origin. Three patients presented with multiple synchronous primary OPSCC cancers; each tumor was analyzed independently. Clinical, histopathologic, and resource usage data were collected and analyzed. Statistical analysis was performed with student's t-test and chi-square testing.

Results: Of 170 OPSCC tumors matching inclusion criteria, 50% (85 of 170) received intraoperative positive control sampling. Eleven percent (18 of 170) of tumors exhibited at least one non-diagnostic frozen margin necessitating additional intraoperative rounds of frozen margin sampling. Margin reversal from positive on frozen sections to negative on final evaluation occurred in 7% (12 of 170) of tumors, whereas reversal from negative to positive occurred in 3% (6 of 170) of cases.

Patients with non-diagnostic intraoperative margins were more likely to experience margin reversal of positive on frozen to negative on fixed ($p < 0.001$). Salvage TORS for tumors with prior head and neck radiation was also associated with positive-to-negative margin reversal ($p = 0.042$). However, no clinical characteristics including tumor site, size, TNM staging, prior head and neck radiation, or non-diagnostic intraoperative margins were associated with negative-to-positive margin reversal.

Use of positive control biopsies was significantly associated with negative frozen margin status upon case conclusion ($p=0.023$) but was not associated with higher rates of negative margin status on fixed sections. In patients with non-diagnostic margins requiring additional intraoperative sampling, use of a positive control biopsy significantly reduced time spent in the operating room ($p=0.028$). This relationship persisted after controlling for surgery type, prior head and neck cancer, or presence of multiple primary tumors ($p = 0.042$).

Conclusions: Frozen intraoperative margins in robotic resections of OPSCC are diagnostically challenging as they are susceptible to uncertainty. Margin status reversal from positive on frozen

to negative on fixed is associated with prior head and neck irradiation and the presence of non-diagnostic intraoperative frozen margins. Margin reversal from negative to positive is not associated with any clinical features and appears stochastic. Intraoperative positive control biopsy can provide clarity in cases with non-diagnostic margins, reducing the need for additional sampling and time spent in the operating room.

A107: AIRWAY PROTECTION AND OUTCOMES AFTER STAGED VERSUS CONCURRENT BILATERAL NECK DISSECTIONS WITH TRANSORAL BASE OF TONGUE CANCER RESECTION

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Importance: Due to substantial rates of contralateral nodal disease in patients with base of tongue (BOT) squamous cell carcinoma (SCC), bilateral neck dissections (BND) are commonly performed, particularly for tumors that approach midline. Conventionally, these neck dissections were staged in order to limit risk of circumferential airway edema and compromise, thereby obviating the need for prolonged intubation and/or tracheostomy. With the rise of less invasive transoral approaches, concurrent bilateral neck dissections may be safely done, which would reduce total surgical and anesthesia time, hospitalizations, and resource utilization. However, there are no studies to date assessing airway and other postoperative outcomes between staged and concurrent ND in transoral BOT patients.

Objectives: To assess airway and resource utility outcomes between patients with BOT SCC who underwent staged BND and those who underwent concurrent BND with their transoral surgery.

Design, Setting, Participants: A retrospective cohort study of consecutive patients with BOT SCC who underwent transoral robotic surgery or transoral laser microsurgery along with BND from January 1, 2015 through October 1, 2021 at our tertiary care center was conducted. Both HPV-related and HPV-unrelated cases were included. Patients who underwent free flap reconstruction were excluded.

Main Outcomes and Measures: The primary outcomes were postoperative intubation, tracheostomy, and intensive care unit admission. Secondary outcomes were progressive care unit admission, total operative time, total length of stay, urgent operative intervention, gastrostomy tube placement, 30-day readmission, and time from surgery to initiation of adjuvant treatment.

Results: In total, 113 patients (mean age 60.8 [SD 8.4] years, 8 [7.1%] females) were included, of whom 44 (39%) underwent staged BND and 69 (61%) underwent concurrent BND with their transoral surgery. The overwhelming majority of patients had HPV-related disease (109/113, 96%) and pathologic T1-T2 disease (106/113, 94%). Demographics and TNM stage distribution were similar between the two cohorts.

There were no significant or clinically meaningful differences in airway events, including postoperative intubation (difference -3.5% [95% CI -10.6% to 3.6%]), re-intubation (difference -1.4% [-4.2% to 1.4%]), and tracheostomy (difference -0.6% [-6.5% to 5.3%]) between the two cohorts. The rates of ICU (difference -1.3% [-9.5% to 6.9%]) and PCU admission (difference -7.9% [-23.3% to 7.5%]), urgent operative intervention, gastrostomy, 30-day readmission, and additional surgery for margin re-resection were also not significantly different. Total operative time (median difference 1.3 [95% CI 0.8 to 1.8] hours) and total length of stay (median difference 1.0 [95% CI 1.0 to 2.0] days) were lower in the concurrent BND cohort. The duration between initial surgery and adjuvant therapy initiation was also lower in the concurrent BND cohort (median difference 4.0 [0.0 to 8.0] days).

Conclusions and Relevance: Concurrent BND with transoral BOT resection appears to be safe with similar airway outcomes compared to ipsilateral neck dissection with transoral BOT resection followed by a staged contralateral neck dissection. Concurrent BND was associated with lower total operative times and total length of stay, which presumably reduce resource utilization and costs.

A109: CLINICO-DEMOGRAPHIC RISK FACTORS OF PATIENT-REPORTED DYSPHAGIA AMONG LONG-TERM OROPHARYNGEAL CANCER SURVIVORS

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Background: Dysphagia, or difficulty swallowing, is a commonly reported side effect of oropharyngeal cancer (OPC) after surgery, radiation therapy (RT) or chemoradiotherapy and can contribute to poor health and quality of life. Morbidities of dysphagia include dehydration, malnutrition, and depression among others. The aim of this study was to investigate the association of clinical and demographic risk factors with moderate to severe patient-reported dysphagia symptoms in long-term survivors.

Methods: A cross-sectional survey included OPC survivors treated at MD Anderson between January 2000 to December 2013. Dysphagia was rated using the MD Anderson Symptom Inventory Head and Neck Cancer Module (MDASI-HN). Single item MDASI-HN dysphagia symptoms were defined as none to mild (score:0-5) versus moderate to severe (score:6-10). Descriptive statistics were conducted, and multivariable logistic regression analysis was used to identify risk factors associated with moderate to severe dysphagia.

Results: A total of 880 responded to the MDASI-HN difficulty swallowing symptom question, of which and 153 (17.4%) reported moderate to severe dysphagia and 727 (82.6%) reported none to mild dysphagia. The median age at diagnosis of survey respondents was 56 (range: 32-84) years and median survival from time of diagnosis was 6 (range:1-16) years. In multivariable analyses, patients with advanced T4 staging (OR, 2.21; 95% CI,

1.08-4.56; p=0.031), those treated with multimodality treatment (OR, 1.82; 95% CI, 1.02-3.26; p=0.043), those with late lower cranial neuropathy (LCNP) (OR, 3.56; 95% CI, 1.59-7.97; p=0.002) and patients that were current smokers at the time of survey (OR, 2.77; 95% CI, 1.20-6.42; p=0.017) had significantly higher odds of moderate to severe dysphagia. Additionally, patients with greater than high school education (OR, 0.60; 95% CI, 0.0.38-0.97; p=0.037), those with N2b and N3 tumors (OR, 0.45; 95% CI, 0.0.22-0.94; p=0.033), and those who underwent bilateral intensity-modulated radiation therapy (IMRT) (bilateral IMRT OR, 0.23; 95% CI, 0.10-0.54; p=0.001, and unilateral IMRT OR, 0.13; 95% CI, 0.04-0.43; p=0.001) had lower odds of moderate to severe dysphagia.

Conclusion: This large survey study identified 1 of 6 OPC survivors who reported moderate to severe dysphagia on long-term follow-up. Several key factors associated with dysphagia were identified. These results reflect survivor groups who may require additional swallowing support and continue to emphasize the need for prolonged surveillance for and supportive treatment of dysphagia years after oncologic cure.

A110: PROSPECTIVE PATIENT-REPORTED QUALITY OF LIFE OUTCOMES FOR HUMAN PAPILLOMAVIRUS ASSOCIATED OROPHARYNX CANCER TREATED WITH TRANSORAL ROBOTIC SURGERY AND NECK DISSECTION ALONE

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Importance: Prospective patient reported quality of life (QOL) outcomes are needed for human papillomavirus-related oropharynx squamous cell carcinoma (HPV+OPSCC) treated with transoral robotic surgery (TORS) and neck dissection (ND).

Design: Prospective repeated-measures study

Setting: Tertiary center

Participants: Treatment naïve patients with American Joint Committee on Cancer (AJCC) 8th edition classification T0-T2 and N0-N1 HPV+OPSCC.

Exposures: Definitive surgery alone with TORS and ND.

Main Outcomes/Measures: Patients completed the following patient-reported outcome measures pre-treatment, 3-months (38/38, 100%), and 1-year (25/38, 66%) postoperatively: University of Washington Quality of Life Questionnaire version 4 (UW-QOL), which includes 16 functions, scored 0-100; European Organization for Research and Treatment of Cancer Quality of Life Questionnaire (EORTC QLQ-C30) and Head and Neck Module (EORTC QLQ-HN35), which include 65 symptoms/functions, scored in various ways; and Neck Dissection Impairment Index (NDII) which consists of 10 functions scored 0-5 (total score of 0-50). Comparisons were analyzed using t-tests at $p<0.05$. Mean score changes (Δ) were compared with published minimally clinically important differences (MCID) available for the UW-QOL and EORTC (but not NDII).

Results: Thirty-eight HPV+OPSCC patients underwent TORS for: base of tongue (17 (44.7%)), palatine tonsil (16 (42.1%)), glossotonsillar sulcus (1 (2.6%)), and true unknown (4 (10.5%)) primaries with ipsilateral ND in 25 (65.8%) patients and bilateral ND in 13 (34.2%) patients for these classifications: pT1 (19/38, 50%), pT2 (15/38, 39.5%), pT0 (4/38, 10.5%), pN0 (2/38, 5.3%), and pN1 (36/38, 94.7%).

Using the UW-QOL, at 3-months, patients reported statistically significant and clinically meaningful (Δ scores exceed MCID) worse mean functional scores for appearance (pre: 91.5, post: 80.9 post, Δ-10.6), shoulder function (97.4, 78.7, Δ-18.7), and taste (98.4, 75.0, Δ-23.4) while at 1-year, patients reported mean scores that were no different than pre-treatment in all domains.

Using the EORTC, at 3-months, patients reported statistically significant and clinically meaningful (Δ scores exceed MCID) worse mean scores for pain (8.1, 18.0, Δ+9.9), swallowing (4.3, 12.7, Δ+8.4), and social eating (2.5, 16, Δ+13.5), while at 1-year, patients reported mean scores that were no worse than pre-treatment in all domains. At 1-year, patients reported significant clinical and statistical improvement of mean scores for mood (pre: 75, 1-year: 90, Δ+15) and anxiety (58.4, 86.8, Δ+28.4). There were no statistically significant or clinically meaningful changes in the pre- and post- treatment global health status/QOL mean scores at either 3-months or 1-year.

Using the NDII, at 3-months, patients reported statistically significant worse mean scores for total score (48.5, 44.5, Δ-4.0), neck stiffness (4.6, 4.2, Δ-0.4), lifting (4.9, 4.2, Δ-0.7), reaching above head (4.9, 4.4, Δ-0.5), overall activity level (4.9, 4.5, Δ-0.4), and recreational activity (4.9, 4.6, Δ-0.3) while at 1-year, patients reported no statistically significant differences in mean scores any of the NDII domains.

Conclusions and Relevance: After TORS and ND for HPV+OPSCC, patients may experience mild pain, mild impacts on appearance, taste, swallowing, and social eating, and mild shoulder dysfunction at 3-months with likely resolution of all such symptoms and dysfunction, including improvements in pre-treatment mood and anxiety, by 1-year.

A111: DO PATIENTS REGRET TRANSORAL ROBOTIC SURGERY FOR OROPHARYNGEAL CANCER?

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Background: Transoral robotic surgery (TORS) is a well-established and minimally invasive alternative primary therapy to standard Radiation therapy for early-stage oropharyngeal squamous cell carcinoma (OPSCC). TORS has been associated with equivalent oncologic control and purported to have potentially improved functional, and quality of life outcomes. However, treatment effects such as dysphagia remain commonly reported and a subset of patients continue on to receive adjuvant therapy.

Objective: The primary objective was to examine patient-reported decisional regret following TORS. Secondary objectives included identifying variables associated with patient-reported regret, dysphagia, and quality of life.

Methods: A cross-sectional survey was administered to 76 patients treated with TORS for early stage OPSCC from February 2016 to August 2021. Patients completed the validated Decision Regret Scale (DRS), MD Anderson Dysphagia Inventory (MDADI), and University of Washington Quality of Life (UW-QoL). Univariate and multivariate analyses were conducted with patient-reported outcomes and clinical data.

Results: A total of 65 (86%) patients completed the survey, with mean age 62, 78.5% male, of which 46% received TORS alone, 40% adjuvant radiation and 14% chemoradiation. 13.8% of patients expressed moderate to high regret following primary surgery. Decisional regret was highly correlated with postoperative dysphagia (τ_{avg}=0.361, p<0.001), and limitations on social and personal life were the strongest driver of decisional regret (p<0.001, τ= 0.481). Univariate analysis showed that clinical (p=0.03, τ=0.26) and pathological N stage (p=0.04, τ =0.20) were predictors of decision regret. Charlson Comorbidity Index (CCI) was a predictor of both dysphagia (p=0.007, τ=0.05) and postoperative quality of life (p=0.001, τ=0.07). The number of positive lymph nodes was a predictor of both postoperative quality of life (p=0.03, τ = 0.17) and decisional regret (p=0.02, τ = 0.04). The primary tumour size, as determined by PET-CT imaging, was a predictor of quality of life (p=0.02, τ = 0.05). Both univariate and multivariate analyses showed no statistical difference in sex, smoking history, primary oropharyngeal site, lymphovascular or perineural invasion, or adjuvant therapy in predicting postoperative decisional regret, dysphagia, or quality of life.

Conclusions: This is the largest study to examine patient-reported regret, dysphagia, and quality of life after TORS for OPSCC. Nodal pathology and preoperative comorbidities accurately predict decisional regret, dysphagia, and quality of life in OPSCC patients. The administration of adjuvant treatment of OPSCC in this cohort did not significantly affect patients' decision regret, perceived quality of life or functional outcomes.

A112: TRANSCERVICAL ARTERIAL LIGATION FOR ALL-COMERS IN TRANSORAL ROBOTIC SURGERY FOR OROPHARYNGEAL SQUAMOUS CELL CARCINOMA: A BLEED-RATE AND VESSEL ANALYSIS

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Introduction: Transoral robotic surgery (TORS) for oropharyngeal squamous cell carcinoma (SCC) carries a known risk of post-operative hemorrhage, with rates estimated between 1-10% of cases. Prophylactic transcervical arterial ligation (TAL) is a strategy to prevent post-operative hemorrhage. Current literature aims to quantify hemorrhage rates following TAL, but these studies are limited by selection bias with often only those patients at highest risk undergoing the procedure. Our institution adopted TAL in 2014 for all-comers undergoing TORS with concurrent neck dissection, independent of patient-specific risk-factors for hemorrhage. This present study aims to determine the rate of post-operative hemorrhage after TAL in all patients who underwent TORS for resection of oropharyngeal SCC with concurrent neck dissection. Secondary aims are to characterize which vessels were ligated via TAL and the means of arterial ligation intraoperatively.

Methods: An IRB approved retrospective chart review was performed on all patients who underwent TORS at a tertiary care academic center from April 2014 through April 2019. Inclusion criteria included that they underwent TORS for oropharyngeal SCC with concurrent neck dissection and TAL, independent of HPV status or adjuvant therapies received. Patients were excluded if they underwent robotic surgery in other anatomic sites, did not undergo neck dissection at the same time as TORS, or if their detailed operative note was not available for review. Patient demographics, including age, risk factors, diagnosis, as well as operative details including the vessels ligated, the method of ligation, and post-operative complications including post-operative hemorrhage were reviewed. Operative, clinic, and inpatient notes as well as documentation of patient calls were studied from the month following surgery to capture bleeding of any severity, which was then classified using the Mayo Clinic Classification System for Postoperative Hemorrhage.

Results: 144 patients met inclusion criteria. 19 out of 144 (13.2%) patients experienced a post-operative oropharyngeal bleed of any severity despite prophylactic TAL. 7 of 19 (36.8%) patients with post-operative oropharyngeal bleeding had self-limited episodes that were observed without intervention. 11 (57.9%) required control of hemorrhage in the operating room, and 1 (5.3%) was embolized by neurointerventional radiology. Arteries were ligated at the following rates: lingual 90.3% (130), facial 87.5% (126), external carotid 37.5% (54), ascending pharyngeal 27.8% (40), superior thyroid 18.1% (26). Other infrequently ligated arteries (<5%) include the occipital, superior laryngeal, and ascending palatine. In 140 cases vessels were hand tied with silk sutures, in 3 cases vessels were clipped, in 1 case they were cauterized.

Discussion: This is the first study that has subjected all patients to ligation, without selection bias, to assess the rate of post-operative hemorrhage after undergoing prophylactic TAL. This provides a more accurate representation of the true bleeding rate following TAL. We characterized the specific arteries ligated and their potential impact on bleeding rates, and based on our analysis conclude that ligation of 3 or more arteries is not superior to the ligation of 2 arteries in preventing post-operative bleeding.

A113: INCIDENCE OF LEVEL IV METASTASIS IN SURGICAL TREATED HUMAN PAPILLOMAVIRUS OROPHARYNGEAL SQUAMOUS CELL CARCINOMA

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Introduction: Patients with human papillomavirus (HPV)- positive oropharyngeal squamous cell carcinoma (OPSCC) often present with significant nodal disease burden. Given the increasing incidence and unique nature of HPV-positive OPSCC, further investigation of nodal patterns in this patient population is warranted.

Methods: A retrospective chart review was performed for patients with HPV-positive OPSCC who underwent up-front transoral robotic surgery (TORS) and neck dissection (comprising at least levels II-IV) between October 2016 and September 2021. Demographic and surgical treatment information was obtained for each patient. Histopathology reports were reviewed for lymph node yield as well as the incidence and distribution of LN metastases, particularly to level IV. Local, regional, and distant recurrences were additionally reviewed for all included patients.

Results: 175 patients underwent a unilateral level II-IV neck dissection for OPSCC with an average lymph node yield of 31.4 (±13.4) LNs. 125 patients had histopathological reports that sufficiently commented on the distribution of lymph node metastases. Of this cohort, 50 patients had quantifiable level IV LN counts, with an average level IV nodal yield of 9.1 (± 5.3) LNs. The corresponding rate of pathologic node-positive disease in level IV was 1.6% (2 of 125 patients). Both patients underwent therapeutic NDs and demonstrated evidence of skip metastases (with one patient presenting with only level IV lymphadenopathy;

and the other with pathologic LNs in levels II and IV with no evidence of disease in level III). The former patient deferred adjuvant chemoradiation and had evidence of regional recurrence within five months of primary surgical resection. There has been no evidence of local recurrence or distant metastases in either patient to date.

Discussion: Our study highlights the low incidence of level IV LN metastases for HPV-positive OPSCC. Both patients with level IV node-positive disease underwent therapeutic ND and demonstrated evidence of skip metastases. Our findings suggest that HPV-positive OPSCC rarely demonstrates occult metastasis to level IV.

A114: OUTCOMES OF RETROPHARYNGEAL LYMPH NODE DISSECTION IN HPV-ASSOCIATED OROPHARYNGEAL SQUAMOUS CELL CARCINOMA PATIENTS TREATED WITH TRANS-ORAL ROBOTIC SURGERY

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Objectives: (1) To describe outcomes of retropharyngeal lymph nodes (RPLN) dissection in HPV+ oropharyngeal squamous cell carcinomas (OPSCCs), and 2) to compare the radiographic and pathological findings of RPLNs.

Study Design: Retrospective chart review.

Methods: Chart review was conducted on patients with HPV + OPSCC receiving TORS at an academic tertiary care center from March 2007 to March 2021. Data collected included patient demographics, treatment information, and imaging and pathology findings for RPLNs.

Results: From a total of 837 patients who underwent primary TORS for HPV-associated OPSCC, 53 patients (6.3%) had ipsilateral RPLNs resected as indicated by radiographic assessment [median age 58 (IQR = 51-64), males 44 (83%)]. Only 18/53 (34%) had prior imaging with positive or atypical RPLN. No contralateral dissection of RPLNs were performed. The vast majority (92%) of patients who received RPLN dissection were tonsillar primary tumors, with the following tumor staging: 38 (72%) early T-stage tumors (cT1/T2), 9 (17%) advanced T-stage tumors (cT3/T4), and 5 (9.4%) unable to be assessed. Metastases to RPLNs were found on surgical pathology in 15 (28%) patients, with 5 found to have extranodal extension. Pathologic 7th edition N-stage 2b or greater was associated with pathologic RPLN metastases (OR 12.63, p = 0.002), but was not associated with radiographic RPLN findings. In particular, all non-tonsillar primaries (3 base of tongue, 1 glossotonsillar sulcus) that received RPLN dissection were found to have pathologic RPLN and pN2b or greater. Recurrence in an RPLN occurred in 3 patients with prior RPLN dissection, none of which had positive RPLN at time of initial surgery. Positive or atypical radiographic RPLN during pre-treatment period was predictive of positive pathologic RPLN (sensitivity 0.73, specificity 0.99, LR+ 101, LR- 0.27).

Conclusion: High rates of metastatic disease are found on RPLN dissection for HPV+ OPSCC. The presence of non-tonsillar primaries with positive RPLN suggests that atypical lymphatic spread may be occurring from extensive cervical lymph nodes metastases. Positive or atypical RPLN on diagnostic imaging is a strong predictor of positive pathologic RPLN, but some metastases may be radiographically silent.

A115: EFFECTS OF OROPHARYNGEAL CANCER EDUCATION ON PEDIATRICS RESIDENTS' HUMAN PAPILLOMAVIRUS VACCINATION PRACTICES

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Importance: As the incidence of human papillomavirus (HPV) related oropharyngeal cancer in the United States increases, vaccination is a safe option for primary prevention of HPV infection. However, less than 40% of adults aged 18-26 report receiving one or more doses of the HPV vaccine, with lower rates in men than women. Provider recommendation is consistently cited as one of the most important facilitators of vaccination, but knowledge deficits among providers regarding the link between HPV and oropharyngeal cancer (OPC) can be a barrier to this recommendation.

Objective: To assess Pediatrics residents' knowledge of HPV-related cancers and vaccination practices before and after a knowledge-based lecture on HPV-OPC given during resident education. Our hypothesis was that provider-focused education can improve understanding of oropharyngeal cancer prevention and consequently alter Pediatrics residents' attitudes toward HPV vaccination.

Design: Single group survey study administered pre- and post-HPV vaccination lecture, which was administered by a head and neck surgeon.

Setting: Two academic medical centers.

Participants: Twenty-eight Pediatrics residents.

Intervention: One-hour didactic presentation on the epidemiology, pathogenesis, and prevention of HPV-related oropharyngeal cancer delivered to Pediatrics residents during resident education by head and neck surgical oncologists.

Main Outcomes and Measures: Anonymous pre- and post-lecture surveys assessing Pediatrics residents' attitudes towards HPV vaccination and usual prescribing practices, barriers to vaccination, and knowledge of HPV's causative role in oropharyngeal cancer. Differences in responses between the two surveys were assessed using a Wilcoxon signed-rank test and McNemar's test.

Results: Pre- and post-lecture surveys were completed by 28 Pediatrics residents. Survey respondents reported a significant increase in their likelihood of discussing the link between HPV and OPC when discussing vaccination with future patients, from a median of somewhat unlikely / somewhat likely on pre-survey to very likely on post-survey based on a 6-point Likert scale ($p<0.05$). Pediatrics residents also reported increased likelihood of continuing the conversation if patients are initially hesitant about vaccination (median increased from likely to very likely, $p<0.05$) and greater agreement that OPC prevention is a motivation for offering the HPV vaccine (median increased from agree to strongly agree on a 7-point Likert scale, $p<0.05$). There was also

a significant improvement in performance on all four questions assessing knowledge of HPV-related cancers.

Conclusions and Relevance: HPV vaccination may prevent cancer-causing infections, yet many physicians do not include the connection between HPV and oropharyngeal cancer when discussing the vaccine with patients. Our results demonstrate that education from a head and neck oncologist for Pediatrics residents can increase awareness of this connection and change perspectives on vaccination. Widespread education of Pediatrics providers on this topic may increase HPV vaccination rates and prevent future cases of HPV-related oropharyngeal cancer.

A116: PRETREATMENT CIRCULATING TUMOR HPV DNA LEVEL IS ASSOCIATED WITH NODAL DISEASE BURDEN, HPV GENOTYPE, AND LYMPHOVASCULAR INVASION AMONG PATIENTS WITH HPV-ASSOCIATED OROPHARYNX CARCINOMA

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Introduction: Circulating tumor human papillomavirus (HPV) DNA (ctHPVDNA) is a dynamic biomarker for HPV-associated oropharynx squamous cell carcinoma (HPV+OPSCC) that varies with burden of disease and treatment response. Determinants of pre-treatment ctHPVDNA level are not well described. This single institution cross-sectional study examined clinicopathologic characteristics associated with pre-treatment ctHPVDNA levels among individuals with HPV+OPSCC.

Methods: Eligible cases were incident or recurrent HPV+OPSCCs diagnosed December 2019-August 2021 evaluated at a tertiary academic center with pre-treatment ctHPVDNA testing. Tumors were considered HPV+OPSCCs if they were p16-positive (p16+) by immunohistochemistry and/or high-risk HPV-positive (HR-HPV+) by in-situ hybridization.

Digital droplet PCR analysis of tumor tissue-modified HPV DNA (NavDx®) from HPV genotypes 16/18/31/33/35 was performed by Naveris (Natick, MA), an independent CLIA-certified laboratory, and reported as fragments/ml (frag/ml) of plasma ctHPVDNA. Cases with 'indeterminate' ctHPVDNA, reported as 5-12 frag/ml, were considered detectable and assigned values of 8.5 frag/ml. Clinicopathologic characteristics were ascertained via electronic medical record abstraction. AJCC 8th edition clinical staging was recorded and adjusted to reflect disease extent at time of blood collection in cases of excisional diagnostic procedures. Proportions were compared using Fisher's exact tests, and medians using Wilcoxon rank-sum or Kruskall-Wallis tests.

Results: The study comprised 84 patients. Most were men (N=74, 87%), white (N=79, 94%), with median age=62.7 years. ctHPVDNA was positive in 72 patients (86%), indeterminant in 2 (2%) and undetectable in 10 (12%). Among undetectables, 8 tumors were p16+/HR-HPV+, and 2 were p16+ without available HR-HPV testing. ctHPVDNA genotype was most commonly HPV16 (N=64, 86%), followed by HPV33 (N=7, 9%), HPV35 (N=2, 3%), and HPV31 (N=1, 1%). Nodal metastasis was significantly associated with detectable ctHPVDNA. Most individuals with N0 disease had undetectable ctHPVDNA (6 of 9, 67%), compared with only 4 of 75 (5%) individuals with N1-3 disease (p=0.001).

Median ctHPVDNA level overall was 284 frag/ml (range=0-60,061; interquartile range [IQR]=27-2,547). ctHPVDNA level was higher for men (289 frag/ml, IQR=33-3,690) than women (68 frag/ml, IQR=9-110; p=0.016), and increased with higher N stage (N0: 0 frag/ml, IQR=0-9; N1: 344 frag/ml, IQR=68-2,407; N2: 1,297 frag/ml, IQR=140-3,566; N3: 3,339 frag/ml, IQR=22-6,656; p=0.001 and ptrend=0.001). Non-HPV16 genotype of ctHPVDNA was associated with significantly lower levels of ctHPVDNA (median=112 frag/ml, IQR=23-237) when compared with HPV16 (median=850 frag/ml, IQR=101-4,255; p=0.012). Demographic characteristics, smoking status, tumor site, T stage, clinical extranodal extension, and neutrophil:lymphocyte ratio were not associated with ctHPVDNA level. Among patients treated surgically, although cases were limited (N=19), ctHPVDNA was significantly higher among those with (N=10) versus without (N=9) lymphovascular invasion (LVI; median=8.5 frag/ml, IQR=0-9 versus 274 frag/ml, IQR=142-10,292; p=0.014), but was not associated with perineural invasion or pathologic extranodal extension.

Conclusion: ctHPVDNA is detectable among nearly 90% of p16+ OPSCC patients, with widely variable levels that appear higher among those with greater nodal disease burden, consistent with prior reports. We also observed higher ctHPVDNA among patients with HPV16 versus non-HPV16 ctHPVDNA, supporting emerging evidence for HPV+OPSCC heterogeneity by HPV genotype. Finally, we report an association between higher ctHPVDNA and LVI, implicating LVI as a means for circulatory shedding of tumor DNA.

A117: INNATE IMMUNITY BIOMARKERS IN HEAD AND NECK CANCER: AN INTEGRATED ANALYSIS OF THE MRNA TRANSCRIPTOME

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Introduction: The immune response has emerged as a key target in head and neck squamous cell carcinoma (HNSCC) that is metastatic, recurrent, or refractory to platinum-based therapy. While immune check point inhibitors help counter tumor evasion of the adaptive immune response, the role of the innate immune response remains less well defined. The most common risk factors for HNSCC, namely HPV and smoking, are both known to be associated with decreased innate immunity. Here we sought to apply an integrated bioinformatics approach and leverage publicly available datasets to help define the key regulators of the innate immune response in HNSCC.

Methods: Correlation Engine (Illumina Inc) was queried for public HNSCC RNA sequencing datasets comparing head and neck tumors of any subsite to normal tissue. Top differentially regulated genes in the innate immune response pathway were identified using a fold change cut off of greater than 1.5 and same directional changes in at least 4 of the 9 available datasets. Pathway analysis was performed using DAVID and STRING software. The R2 database was used to validate hub gene expression using Kaplan Meier analysis of overall survival of HNSCC patients in The Cancer Genome Atlas(TCGA) database with subgroup analysis based on smoking, HPV status and subsite.

Results: Analysis of differential mRNA expression in 9 available HNSCC datasets resulted in 25 top upregulated and 18 top downregulated genes. Pathway analysis of these differentially expressed gene sets in DAVID revealed upregulation of the RIG-1/MAVS/TBK1 and Toll-Like Receptor pathways and down regulation of the complement and MAPK pathways. STRING network analysis of differentially regulated genes revealed ISG15, IRF7, DDX58, IFIH1, TLR2, CASP1, ATG12, MAPK3 and C3 as hub genes. Survival analysis of all hub genes was validated in of the TCGA dataset.

Subgroup analysis was carried out after stratifying patients based on HPV status, smoking status, and tumor subsite. Out of the 9 hub genes the most significant biomarker identified was ISG15 which was a poor prognostic indicator independent of subsite when upregulated. Interestingly, in HPV+ HNSCC ISG15 upregulation was associated with a favorable survival prognosis, whereas upregulation of ISG15 was significantly associated with worse prognosis for HPV - HNSCC (Figure 1). When subgroup analysis for smoking status was performed a similar pattern was observed.

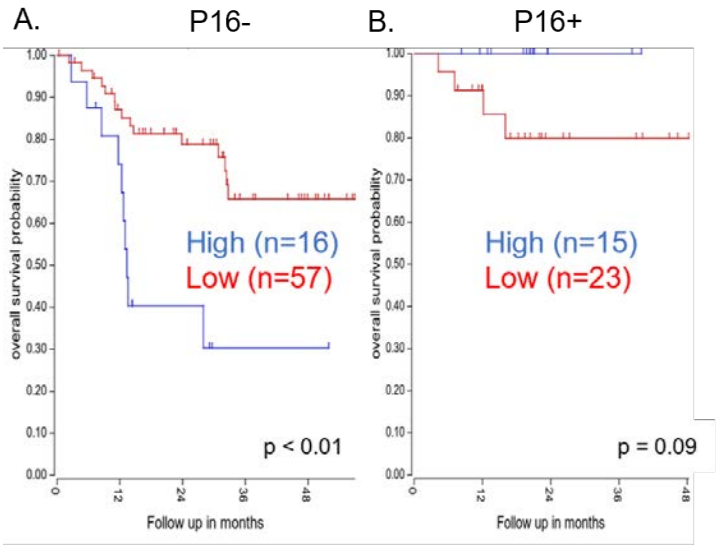

Figure 1. ISG15 upregulation is associated with worse overall survival in P16- tumors (A) though the opposite trend is seen in P16+ tumors (B).

Conclusions: The RIG-1/MAVS/TBK1 pathway is critical in the innate immune response to viruses including HPV as well as tumor response to chemotherapy. ISG15 may be a useful biomarker for chemoresistance in HPV+ HNSCC and may help identify patients at risk of therapeutic failure. Targeting the RIG-1 pathway may additionally serve as a potential therapeutic strategy in HNSCC and requires further investigation.

A118: IMPACT OF TARGETED THERAPY IN ANAPLASTIC THYROID CARCINOMA

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Importance: Anaplastic thyroid cancer historically is known to have a poor prognosis regardless of the treatment pursued. However, recent advances in genetic sequencing coupled with individualized targeted therapy has shown to increase overall survival.

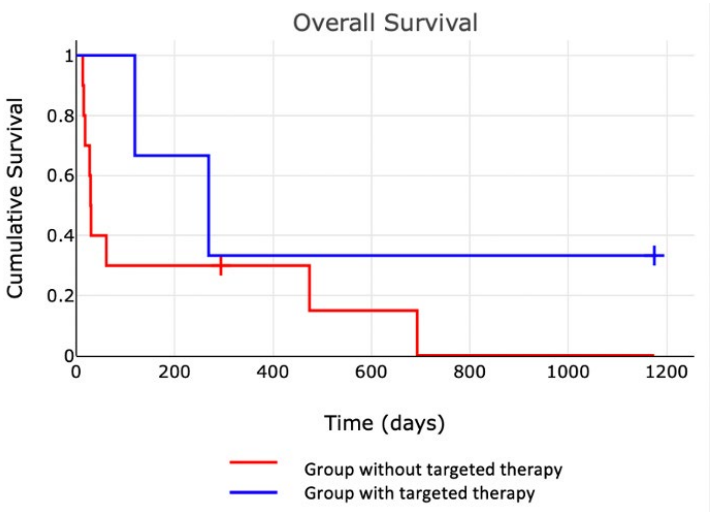
Objective: The purpose of this study was to analyze the impact of different treatment modalities including targeted gene therapy on overall survival of patients with anaplastic thyroid carcinoma.

Design, Settings, and Participants: Data was collected retrospectively from a tertiary care academic medical center. Patients with anaplastic thyroid carcinoma who received treatment from 2005-2021 were identified through pathology records. The cohort was divided into those who received targeted gene therapy and those who did not receive targeted gene therapy.

Outcomes and Measures: Overall survival was evaluated using a Kaplan-Meier survival curve.

Results: Thirteen patients with anaplastic thyroid cancer were identified. The median patient age at diagnosis was 60 years [range, 42-100], 8 male and 5 female. Two patients were stage IVa, 6 were IVb, and 5 were IVc. Six patients were treated with primary resection, 3 of which underwent adjuvant chemoradiation and 1 with adjuvant radiation alone. Three patients were treated with primary chemoradiation. 6 patients underwent genetic testing, 4 were found to have treatable mutations. 3 of these patients were treated with targeted gene therapy consisting of trametinib +/- dabrafenib, one who also underwent immunotherapy with pembrolizumab. Targeted genetic mutations included BRAF V600E (n=2) and NRAS Q61 (n=1). Of the 3 patients treated with targeted therapy, 2 were stage IVb and 1 IVc. Overall median survival for the patients without targeted therapy was 29 days compared to a median survival of 269 days for patients with targeted therapy (p-value 0.22).

Conclusions and relevance: In this single institution study we demonstrate a 9 fold difference in overall survival between patients treated with vs without targeted therapy. These findings support the growing evidence behind targeted gene therapy for anaplastic thyroid carcinoma.



A119: SAFE EXCLUSION OF TRACHEOSTOMIES IN FREE TISSUE TRANSFERS FOR HEAD AND NECK RECONSTRUCTIONS

Alice Q Liu, MD; Kevin Zhao, MD; Emily C Deane, MD; Sally Nguyen, MD, FRCSC; Jamie Kwon; Donald W Anderson, MD, FRCSC; J. Scott Durham, MD, FRCSC; Eitan Prisman, MD, FRCSC; University of British Columbia

Introduction: The necessity of tracheostomies has been increasingly examined in head and neck ablative procedures. The primary objective of this study was to review which patient characteristics were associated with or without tracheostomy during free tissue transfers (FTT). Secondary objectives included determining the association between FTTs with or without tracheostomies and postoperative morbidity.

Methods: Retrospective chart review of patients who underwent a FTT from January 2015 – May 2021 at a single tertiary centre. Patient variables and post-operative course data was extracted. Analysis was completed with descriptive statistics, paired t-test, Chi-square test, and a univariate and multivariate linear regression.

Results: In total, 535 patients met inclusion criteria. The most common primary site was oral cavity (N = 378) and the most common donor was the radial forearm (N=251). Tracheostomies were carried out in 54.7% of cases; however, there were significantly less tracheostomies done in the last two years (p <0.001). Patients who had tracheostomies had more comorbidities, as measured by the Charlson Comorbidity Index (p<0.001), more alcohol use (<0.001), and higher BMIs (p<0.05). Patients who underwent tracheostomies also had longer operative times (p<0.001), lengths of stay (p<0.001), and days until resumption of oral diets (p<0.001). Patients were more likely to have severe post-operative complications in the tracheostomy cohort, as measured by the Clavien Dindo classification (p = 0.01). The multiple linear regression had site of primary lesion (p<0.001), clinical nodal stage (p<0.05), and total surgical time (p<0.001) associated with tracheostomy. There was no significant difference in airway compromise or FTT failures between the two groups.

Discussion: At our institution, the frequency of tracheostomies has been decreasing since 2018. Patients who underwent tracheostomies for head and neck FTTs had more comorbidities and required longer operative times and lengths of stay. They were also statistically more likely to have severe post-operative complications. The site of the primary lesion, clinical nodal stage, and total operative time were predictive of tracheostomy. Nearly half of patients with head and neck ablative surgery reconstructed with FTT were safely treated without requiring tracheotomies. Patients without tracheostomies did not have increased airway complications or post-operative complications, and had earlier resumption of an oral diet and discharge from hospital.

A120: EVALUATION OF GAMMATILES FOR DELIVERY OF CS-131 IN HEAD AND NECK CANCER

Aarti Agarwal, MD; Bryan Renslo, BS; Reza Taleei, PhD; Joseph Pinto, MS; Voichita Bar-Ad, MD; Adam Luginbuhl, MD; Thomas Jefferson University Hospital

Background: Brachytherapy has been used for HNC, but is associated with complications including necrosis of surrounding tissues, recurrence, infection, and seed migration. GammaTile® (GT), a new mode of brachytherapy delivery in which Cesium-131 (Cs-131) seeds are embedded into a collagen matrix, yields an even distribution of radiation with proper spacing within the intended field of treatment.

Objectives: In this experimental study, we compare the ease of use, time to implantation, and radiation dose delivered to the carotid artery between GT and traditional stranded Cs-131 seeds implanted after bilateral neck dissections in cadavers.

Methods: Bilateral neck dissections were completed on three cadavers with infusion of the carotid system with contrast. GT and traditional stranded Cs-131 seeds were implanted on opposite necks for comparison. Time of implantation was recorded. A Likert scale survey regarding the ease of use of GT was completed by 3 separate head and neck surgeons. CT images were obtained to calculate radiation dosimetry. For the dose computation, physicists were blinded to the side with GT vs strands of traditional Cs-131. TG-43 dosimetry calculation protocol was employed with a point source assumption. Carotid arteries were contoured in MIM-Symphony software to provide a dose calculation in accordance with TG-43 specifications as the primary normal tissue in the vicinity of the OR resection.

Results: Ease of use score was higher in GT compared to stranded seeds with a mean score of 6.3 +/- 1.2 compared to 4.5 +/- .87. Time of implantation was statistically significantly lower, p = .031, in the GT group (M=5.17 minutes, SD=4.62) compared to stranded seeds (M=15.83 minutes, SD= 3.24) . Mean radiation dose to the carotid artery was 62.8Gy +/- 9.46 in the GT group compared to 108.2Gy +/- 55.6 in the traditional Cs-131 seeds group.

Conclusions: We present a feasibility and concept cadaveric study demonstrating a collagen matrix stabilization system for Cs-131 with preliminary evidence to support its ease of use, decreased time to implantation, and decreased dose delivered to the carotid artery.

A121: PECTORALIS MAJOR OSTEOMYOCUTANEOUS FLAP FOR MANDIBULAR RECONSTRUCTION: A CASE SERIES

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Background: First described in 1980, the pectoralis major flap with vascularized rib presents a unique option for reconstructing complex head and neck defect involving mandible. It provides the surgeon with a well vascularized osteomyocutaneous regional flap in patients who are poor free flap candidates and allows for reconstruction to be done in a single stage. We present a discussion of our cases, the operative technique, indications and potential pitfalls.

Methods: We present a series of three patients who underwent reconstruction with an osteomyocutaneous pectoralis flap. A similar surgical technique was performed in all cases. This involved standard elevation of the myocutaneous portion of the pectoralis flap with incorporation of a portion of the 5th or 6th rib. To incorporate rib, the periosteum of the rib was kept in continuity with the overlying musculature to preserve its blood supply. Osteotomies were performed in an anterior to posterior direction, ensuring to free and preserve the integrity of the underlying pleura during the process. The harvested rib was then kept in continuity with the flap during remaining elevation. Surgical photos are shown in figures 1 and 2.

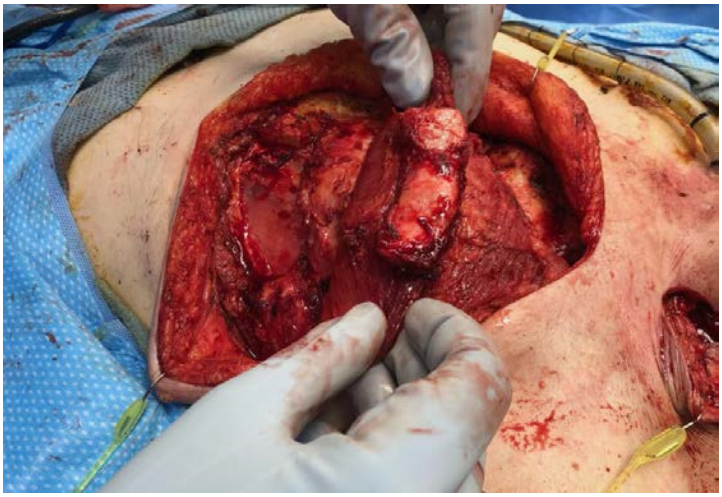

Figure 1. Elevated pectoralis major muscle with incorporated rib segment

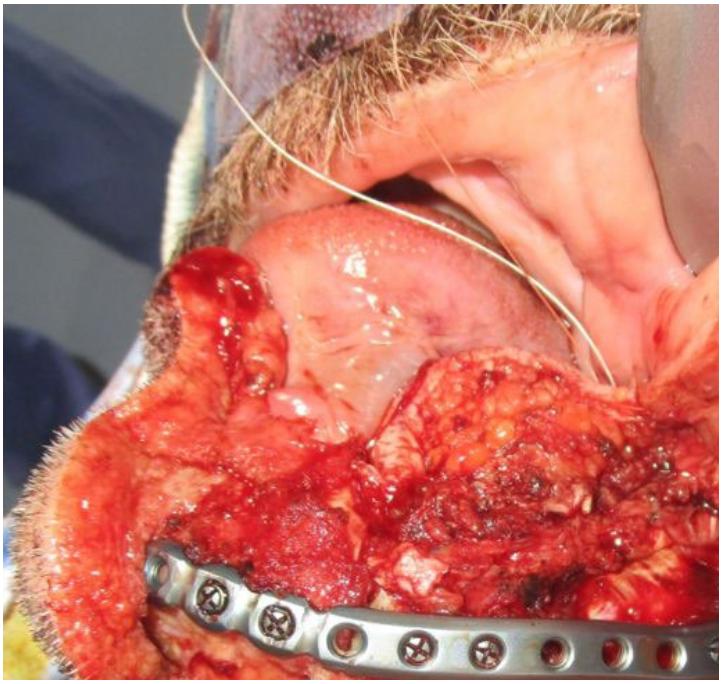

Figure 2. Rib segment spanning segmental mandibulectomy site

Results: Three patients underwent osteocutaneous pectoralis flap for reconstruction of mandible defects. All three patients underwent reconstruction of mandibular body defects, with two patients having concomitant cutaneous defects. Two patients had prior primary surgeries for advanced oral cavity tumors involving the mandible, which were initially reconstructed with fibula free flaps. One subsequently had free flap failure, with associated wound complications. The second patient developed osteonecrosis of his fibula flap one year after adjuvant radiation treatment. The third patient had significant vascular disease and a complicated history of lower and upper extremity orthopedic trauma, limiting free flap options for primary reconstruction. Given their complex treatment history, medical comorbidities, and vessel depleted necks, these patients were not optimal free flap candidates.

Two patients had minimal (seroma) or no post-operative complications. One of three had a persistent orocutaneous fistula requiring wound debridement in the acute post-operative period. In this case bone viability was confirmed by the presence of intraoperative bleeding during the debridement. However, he had persistent issues with infection and the flap was subsequently removed four months after surgery with non-viable bone noted.

Oral diet was resumed in two of three patients. One patient was feeding tube dependent prior to surgery and remains without oral intake. All three patients had adequate initial cosmetic outcomes.

Discussion: The current report demonstrates that, in patients who are poor free flap candidates the osteomyocutaneous pectoralis major flap still plays a valuable role in the head and neck reconstruction ladder. This is a fairly easy, quick, and single stage technique for reconstruction of composite defects involving the mandible.

A122: MANAGEMENT OF FREE FLAP FAILURE IN HEAD AND NECK SURGERY

Ethan J Craig, MD, MPH; Amit Walia, MD; Kwasi Enin; Ryan Jackson, MD; Sid Puram, MD, PhD; Patrik Pipkorn, MD, MSCI; Washington University in Saint Louis

Background: Free flap tissue transfer has become a key technique for head and neck reconstruction following tumor resection. As factors associated with flap loss have been studied, description of secondary reconstructive efforts in the setting of flap loss have been less reported. Flap failure can require reoperation and has been reported to increase hospital length of stay, readmission rate, and delay initiation of adjuvant therapy. Flap failure can be a devastating complication for patients and surgeons alike and subsequent management and decisions may be hampered by fear of losing additional flaps. The purpose of this study is to review and analyze management of free flap failure at our own institution and describe outcomes following secondary free flaps, regional flaps or conservative management.

Methods: A single institution retrospective review was performed. Approval for the study was obtained from the Washington University School of Medicine Institutional Review Board. Patients were included if they underwent free flap at our institution between January 1st, 2004, and January 1st, 2021. Patients who had undergone prior free flap outside of the study period but returned for a separate free flap during the study period were included (i.e., free flap for osteoradionecrosis). Patient information regarding flap type, indication, length of stay, 30-day readmission, and start date of adjuvant therapy was extracted from the electronic medical record. Kruskal-Wallis and Chi squared tests were used for analysis.

Results: A total of 1148 patients were included in the review. The most common type of flap was fibular osteocutaneous free flap (30.8%). Oral cavity and oropharynx comprised of 86.2% of flap sites. 1083 flaps were determined to be healthy with no failure. 25 flaps had partial failure (2.17%). 40 flaps had total failure (3.48%). 80% of flaps were used after oncologic resection. Of the 65 patients with flap failure, data on second treatment for tissue defect was available for 60 patients; 27 were managed with conservative treatment, 23 were managed with a regional flap, and 10 were managed with a second free flap. Of the 10 second free flaps, 9 flaps were successful, 1 flap had partial failure, and no

flaps had total failure.

Patients that had flap failure compared to those that did not had a significantly different median length of stay (10 days versus 17, p<0.0001) and median time to adjuvant therapy (51 days versus 59, p=0.035) with no difference in their 30-day readmission rate (21.0% versus 28.3%, p=0.153)

Comparing failed flaps that were managed conservatively to flaps managed with a regional flap or free flap (Figure 1), there was no significant difference in median length of stay (15.5 days versus 19, p=0.058), time to adjuvant therapy (59 days versus 59, p=0.742) or 30-day readmission rate (32% versus 32.3%, p=0.984).

Conclusion: Free flaps can safely be performed in a setting of first flap failure without significant increase of failure from baseline risk. Careful examination of indication, patient wishes, and surgeons' comfort will still need to guide decision making in these challenging situations.

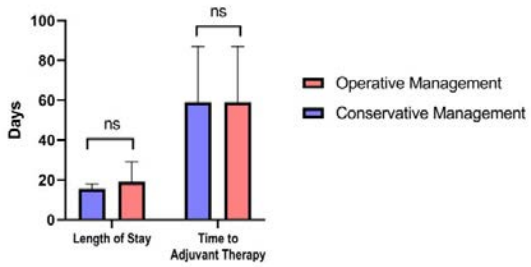

Figure 1: Length of stay and time to adjuvant therapy (days) for conservative management compared to operative management (median, 95% CI). There were no significant (ns) difference between the medians of the two groups for either length of stay (p=0.058) and time to adjuvant therapy (p=0.742) using Kruskal-Wallis test.

A123: FACTORS IMPACTING DISCHARGE DESTINATION FOLLOWING MICROVASCULAR RECONSTRUCTION

Larissa Sweeny[1]; Allison Slijepcevic, MD[2]; Ashley Kraft[1]; Joseph Curry[3]; Ramez Philips[3]; Kelsie Guice[1]; Caroline Bonaventure[1]; Adam Luginbuhl[3]; Meghan Crawley[3]; Eleanor McCreary[2]; Michelle Bunke[2]; Mark K Wax[2]; [1]LSU-HSC, New Orleans; [2]OHSU; [3]TJU

OBJECTIVE: Determine which variables impact postoperative discharge destination following microvascular free flap reconstruction in the head and neck.

STUDY DESIGN: Multi-institutional retrospective review of a prospectively collected databases.

METHODS: Patients undergoing microvascular free flap reconstruction of head and neck defects at two tertiary care institutions between January 2010 and December 2019 were included (n=1,972). Discharge destination was documented for 1,495 of the patients. Patients were divided into cohorts based on discharge destination [home, skilled nursing facility (SNF), rehabilitation center, death]. Factors examined include patient demographics, indication for surgery, anatomic site, donor site, duration of the operation, length of stay, discharge destination, surgical complications (free flap failure, fistula formation, hematoma, wound dehiscence, wound infection) and medical complications [thromboembolism (deep vein thrombosis or pulmonary embolism), cerebral vascular event (stroke), cardiac (myocardial infarction, cardiac arrest, heart failure), pulmonary (pneumonia, respiratory distress syndrome)].

RESULTS: The mean age of patients returning home following discharge was lower (60, n=1194) compared to those discharged to a SNF (69, n=163) or a rehabilitation center (70, n=130), or those who died within 30 days (71, n=8)(p<0.0001). Females were less likely to be discharged to home (77%, n=428/553) compared to males (81%, n=766/942)(p=0.04). Mean operative time (hours) correlated with discharge destination: home (9.1), SNF (7.6; HR 2.1 95%CI 1.7-2.7) and rehabilitation center (12.5; HR 1.7 95%CI 1.5-2.1)(p<0.0001). Mean length of stay (days) correlated with discharge destination: home (9), rehabilitation center (13, HR1.8 95%CI 1.5-2.0), SNF (13, HR1.9 95%CI 1.6-2.2)(p<0.0001). Patients were less likely to be discharged home if they experienced alcohol withdrawal (69% versus 81%; p=0.04), a postoperative wound dehiscence (64% versus 81%; p=0.0006), a thromboembolic event (58% versus 80%; p=0.004), a pulmonary complication (45% versus 82%; p<0.0001), a cardiac complication (55% versus 81%; p<0.0001), a cerebrovascular event (27% versus 80%; p<0.0001) or developed sepsis (60% versus 80%; p=0.002). The odds ratios for discharge to a facility versus home by variable were: cardiac disease (OR 1.8 95%CI 1.4-2.3), wound dehiscence (OR 2.3 95%CI 1.5-3.4), pulmonary complication (OR 5.0 95%CI 3.2-7.8), cardiac complication (OR 3.5 95%CI 2.2-5.4), thromboembolic event (OR 2.7 95%CI1.5-5.0), cerebrovascular event (OR 11.8 95%CI 3.2-43.7). There was no correlation with discharge destination and occurrence of a postoperative wound infection, salivary fistula, partial tissue necrosis or free flap failure. Thirty-day readmission rates were similar when stratified by discharge destination: home (15%), SNF (19%), and rehabilitation (12%)(p=0.20).

CONCLUSION: Patient age, operative duration, length of hospitalization and occurrence of a medical complication postoperatively correlated with discharge destination. There was no correlation with anatomic site, free flap donor selection, or free flap survival and discharge destination.

A124: ASSOCIATION OF ASPIRIN RESISTANCE WITH WOUND HEALING COMPLICATIONS IN HEAD AND NECK FREE TISSUE TRANSFER

Danielle E Scarola, MD[1]; Hannah Moriarty, MD[2]; Cheryl Maier, MD[2]; H. Michael Baddour, MD[2]; [1]Case Western/University Hospitals Cleveland; [2]Emory University

IMPORTANCE: Advances in head and neck microvascular free tissue transfer have significantly decreased the risk of total flap failure; however, wound healing, fistula and partial flap complication rates remain high. The use of aspirin (ASA) after free tissue transfer (FTT) to prevent flap failure has been a common practice among head and neck surgeons despite inconsistent evidence regarding its efficacy. The phenomenon of aspirin resistance (i.e. inadequate anticoagulation response despite aspirin therapy) is well described in the cardiac literature and is a significant predictor of morbidity and mortality those patients. Failure to account for ASA resistance may explain the poor quality of evidence in our patients. Aspirin resistance in the head and neck FTT population has not been previously studied and therefore the implications are unknown.

OBJECTIVE: To determine the prevalence of aspirin resistance in head and neck FTT patients and compare post-operative complications in the resistant versus the responsive cohorts.

DESIGN, SETTING & PARTICIPANTS: This prospective cohort study was conducted from February 2020 to July 2020 at a high-volume tertiary care hospital. Participants included 50 adult patients undergoing free tissue transfer to the head and neck

with 30-day follow up. Those with hemoglobin A1C>7.5, CKD III or IV, BMI <17.5 and those taking alternative anticoagulation were excluded.

EXPOSURES: Aspirin resistance was assessed using the AspirinWorks® Urine assay for 11-dehydro-thromboxane B2.

MAIN OUTCOMES & MEASURES: Free flap complications (i.e. partial or total failure), wound healing complications, bleeding complications, clotting complications, mortality, LOS and 30-day re-admission were recorded.

RESULTS: Of the 50 patients, 36 (72%) were resistant to aspirin. All complications occured in the apsirin resistant group with an overall complication rate of 55.5% compared to a 0% in the aspirin responsive cohort (p<0.001). Wound healing complications comprised the majority of these with 17 significant complications (i.e. requiring bedside or operative intervention) in the unresponsive group (47%). Other complications included one partial flap failure, one hematoma, one DVT and one patient death (related to fistula and carotid blowout).

CONCLUSIONS & RELEVANCE: Aspirin resistance was associated with higher wound healing and overall complications after head and neck free tissue transfer. Future research should evaluate whether targeting potentially modifiable factors such as increasing aspirin dose could reverse the observed negative associations with postoperative outcomes.

A125: EMPLOYMENT OF "PROPHYLACTIC" TRACHEOSTOMY IN FREE-FLAP RECONSTRUCTIVE SURGERY OF THE HEAD AND NECK

Hannah J Brown, BS[1]; Hannah N Kuhar, MD[2]; Ashley Heilingoetter, MD, MPH[2]; Samer Al-Khudari, MD[3]; Peter C Revenaugh, MD[3]; Kerstin Stenson, MD[3]; [1]Rush Medical College of Rush University; [2]Ohio State University; [3]Rush University Medical Center

Objective: To determine which patients may benefit from intraoperative or "prophylactic" tracheostomy placement at the time of ablative surgery and free flap reconstruction, and to provide general guidelines for PT placement.

Methods: A retrospective review from 2015 – 2018 yielded 88 patients who underwent free-flap reconstruction for defects from resection of head and neck lesions at Rush University Medical Center. Comparisons were made between patients who received prophylactic tracheostomy at the time of surgery and those who did not.

Results: 88 patients were included. 59 patients did not receive prophylactic tracheostomy (no prophylactic tracheostomy (NPT)) and 29 received prophylactic tracheostomy (PT) at the time of surgery. Of the 29 PT cases, 16 underwent decannulation prior to discharge. Compared to NPT patients, PT patients had longer average intensive care unit (ICU) length of stay (LOS) (6.41 ± 1.54 days vs. 3.34 ± 0.14 days, p<0.006) and total hospital LOS (15.10 ± 1.79 days vs. 10.68 ± 0.95 days, p<0.018). PT patients had a higher incidence of postoperative wound or airway complications compared to NPT patients (27.6% vs. 6.8%, respectively, p<0.011). There was no statistically significant difference in incidence of general postoperative complications between PT and NPT patients 48.3% vs. 44.1%, respectively, p<0.442). Among NPT patients, only 2 required tracheostomies prior to discharge. Other correlations and recommendations are described.

Conclusion: Many patients undergoing free-flap reconstruction for defects from head and neck carcinoma resection do not require PT. PT may add additional morbidity to complex tumor resections and reconstruction. Selected patients may safely undergo ablative surgery and free-flap reconstruction without PT.

A126: UTILITY OF THE SALIVARY BYPASS TUBE FOR PREVENTION OF STENOSIS AND FISTULA AFTER TOTAL PHARYNGECTOMY

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Pharyngoesophageal stenosis and pharyngocutaneous fistula formation are common complications following pharyngeal reconstruction after head and neck cancer resection, particularly after laryngectomy with or without pharyngectomy. The Montgomery salivary bypass tube, first introduced in 1955, is a silicone stent made to sit in the reconstructed neopharynx and shunt saliva past pharyngeal suture lines to facilitate healing. Some advocate for routine placement of the salivary bypass tube during primary neopharyngeal reconstruction with a goal of preventing pharyngocutaneous fistula and pharyngoesophageal stenosis. However, the benefit is unclear when considering specifically the total pharyngectomy patient, in whom a circumferential segment of pharynx has been resected. We report 36 consecutive cases involving total pharyngectomy with tubed free flap pharyngeal reconstruction from 2010 to 2021. Nineteen (53%) had salivary bypass tubes placed at the time of surgery. These were left in place for 27.2 days on average. Overall, 24 (67%) developed pharyngoesophageal stenosis and 19 (53%) developed pharyngocutaneous fistula. There were no statistically significant differences in the rates of either pharyngocutaneous fistula or pharyngoesophageal stenosis between those who had a salivary bypass tube placed and those who did not. Four of 19 (21%) salivary bypass tubes were found to have migrated out of place or rolled upon themselves and one patient developed nasal columellar breakdown from the anchoring stitch. The salivary bypass tube is of questionable benefit in preventing pharyngoesophageal stenosis or pharyngocutaneous fistula formation following total pharyngectomy.

A127: EFFICIENCY IN HEAD AND NECK FREE FLAP SURGERY: ASSESSMENT AND IMPACT OF BOTTLENECKS IN THE PERIOPERATIVE WORKFLOW

Andrew Prince, MD; Mia Jusufbegovic, MD; Ameer Ghodke, MD; Wendell Yarbrough, MD; Trevor Hackman, MD; Catherine Lumley, MD; Travis Schrank, MD, PhD; Jeffrey Blumberg, MD; Samip Patel, MD; University of North Carolina

Introduction: Head and neck free flap reconstructive surgeries are complex and challenging cases. They represent one of the most labor and resource intensive surgeries at academic institutions. Historically, these surgeries are associated with prolonged operative times. Naturally, these prolonged operative times, combined with overall care-delivery processes within a large hospital system are subject to numerous inefficiencies. Furthermore, increased operative times are associated with poor patient outcomes including increased length of stay.

Objective:

1. Assess the impact of total operative time on outcomes of

patients undergoing head and neck free flap surgery

2. Identify opportunities for improvement in perioperative workflow for patients undergoing head and neck free flap surgery in order to reduce total operative times.

Methods: IRB approval was obtained and a retrospective chart review of patients undergoing free flap surgery between 2018-2019 at single quaternary academic medical center was performed to analyze total operative times, length of stay data, and complications.

Results: 335 patients undergoing head and neck free flap surgery were identified from 2018-2019. Multivariate analysis demonstrated a 0.791 increase in length of stay for every 1 hour in increase of operative time. Mean total operative time (in-room to out-of-room time) was 10.43 hours. Mean pre-incision time (time from in-room to incision) was 1.04 hours. Mean incision to wound closure time was 8.45 hours. Mean time from wound closure to out-of-room time was 1.05 hours. Mean length of stay was 13.43 days. 53 (15.8%) patients experienced a readmission within 30 days of discharge. 301 (89.9%) patients were discharged home. Univariate analysis of operative variable associations with total operative time found that gender, free flap type (soft tissue vs bone) and anesthesia provider count to be significant ($p<0.05$).

Conclusion: A true direct observational analysis of free flap surgery can be difficult to conduct due to the inherent nature of its many components and prolonged procedure times. A direct correlation between increased total operative time and length of stay exists in our population. Therefore, these surgeries demand efficiency improvement in attempt to decrease length of stay. Identifying efficiency improvement opportunities in each perioperative phase (pre-incision period, incision to wound closure period, and wound closure to out-of-room period) may reduce total operative times.

A128: ENDOSCOPIC SKULL BASE SURGERY FOR FREE FLAP RECONSTRUCTION OF CLIVAL DEFECTS

Ross Rosen, Bsc; Jenna E Bergman, MD; Mark Tabor, MD; Siviero Agazzi, MD, MBA, FACS; Harry Van Loveren, MD; Matthew Mifsud; University of South Florida

Importance: Reconstruction of clival defects with traditional mucoperichondrial grafts are challenging in patients with previous surgery, infection, or radiation. Endoscopic free tissue flaps are a key alternative technique that allows for minimally invasive inset of viable tissue in otherwise devascularized wound beds.

Objective: To assess the utility of endoscopic free flaps to reconstruct clival defects in patients lacking adequate native tissue in the nasopharynx due to prior surgery, radiation, or infection.

Design, Setting, Participants: This retrospective case series describes four patients who underwent endoscopic skull base surgery for free flap reconstruction of clival defects at a tertiary care facility. All four patients in this series had extensive osteoradionecrosis of the clivus following treatment for various skull base disorders.

Main Outcomes and Measures: This study reports the indications, surgical techniques, postoperative results, and complications associated with endoscopic free tissue reconstruction of clival defects in patients who were not viable candidates for locoregional graft reconstruction.

Results: Four patients (age range 36-67 years, mean 51 years) were included. The primary tumor sites included the nasopharynx, clivus, and upper cervical vertebrae. The indications for free flap reconstruction were nasoseptal defects, velopharyngeal insufficiency, and osteoradionecrosis from prior radiation therapy. Skull base reconstruction was performed utilizing free adipofascial or myofascial flaps from the radial forearm or anterolateral thigh sites. In all cases the flaps were placed into the clival defect through a transoral approach with the pedicles tunneled to the appropriate neck for vascular access via the parapharyngeal space. Despite performing total clival and posterior pharyngeal reconstructions, flaps were mainly inset with a combination of fibirin glue, duracel, and nasal packing which were able to safely secure them in place until healing. Two patients underwent tracheostomy at time of surgery given extensive treatment change and to prevent airway obstruction secondary to tissue edema during post-operative healing. The average length of hospital stay was 8.5 days. All four cases healed without flap failure or CSF leak. One patient developed nasopharyngeal stenosis requiring secondary reconstruction.

Conclusion and Relevance: Endoscopic skull base surgery for free flap reconstruction of clival defects is a safe and effective treatment for patients with nonviable local tissue. This approach may be used to repair skull base defects in patients with compromised or damaged nasoseptal tissue from previous surgery, radiation or infection.

A129: ACCURACY AND OUTCOMES OF VIRTUAL SURGICAL PLANNING AND 3D-PRINTED SURGICAL GUIDES FOR OSSEOUS FREE FLAP RECONSTRUCTION OF OSTEORADIONECROSIS-RELATED MANDIBULAR DEFECTS

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OBJECTIVES: To examine reconstruction accuracy, complications and functional outcomes following 3D osseous reconstruction for mandibular osteoradionecrosis (ORN).

BACKGROUND: Mandibular ORN is a severe complication of radiation therapy (RT) for head and neck cancer. The mainstay of treatment for Schwartz stage III mandibular ORN is osseous free flap reconstruction, which aims to reduce pain, chronic fistulization, trismus and improve occlusion/jaw alignment. Recently, virtual surgical planning (VSP) and 3D-printed surgical guides have been shown to ease intraoperative decision making and reduce operative time. Few studies have examined outcomes of 3D-techniques for ORN cases, which pose unique challenges including distorted occlusion, extensive scarring, and poor wound healing.

STUDY DESIGN/METHODS: Single academic medical center retrospective chart review of ORN-related osseous free flap mandibular reconstructions with VSP and 3D-guides between January 2015 and March 2021. Patient demographics, ORN risk factors, treatment variables and outcomes were extracted. Accuracy was assessed by 3D-overlay computer models with cephalometric measurements.

RESULTS: Twenty-six cases were identified with a mean follow up of 85.1 weeks. The majority of patients were male (69%); mean age was 64 years. Most patients had history of oral cavity cancer

(N=16, 61%), and the majority had prior oral cavity surgery (N=21, 81%), including 9 cases (35%) with prior mandible surgery. All cases received prior RT; 7 cases (27%) had >1 course of RT. Fifty-eight percent (N=15) had post-radiation dental extractions. In addition to ongoing ORN, 5 cases (19%) had absent mandible segments needing secondary mandibular reconstruction. The most common ORN-related preoperative clinical findings included: malocclusion/jaw malalignment (N=24), trismus (N=21), pain (N=21), mandibular fracture (N=21) and orocutaneous fistula (N=13). Mean time from last radiation dose to mandibular reconstruction was 84.6 months.

All cases underwent fibular free flap reconstruction except for one case reconstructed with iliac crest-internal oblique free flap. Mean operative time was 10.4 hours. There were no flap failures; two cases returned to the operating room for vessel revision and hematoma evacuation. Minor primary site or neck infection occurred in 11 cases. Average length of stay was 13 days.

Long term outcomes were favorable with a minority of patients developing delayed complications including minor primary or neck infection (N=7) and donor site complication (N=1). 3D-computer-overlay accuracy demonstrated minimal deviation between planned and actual reconstruction as measured by four primary cephalometric outcomes among 18 evaluable patients. Average deviation from planned was as follows: intercondylar distance = 1.5mm (SD 2.4); intergonial distance = 1.8mm (SD 2.0); anterior-posterior distance = 2.1mm (SD 1.9); gonial angle = 3.3mm (SD 2.4). Functional outcomes revealed substantial improvements: only one case reported residual pain; 14/21 (67%) with preoperative trismus, clinically improved; 21/24 (87%) with preoperative malocclusion/jaw malignment, clinically and radiographically improved.

CONCLUSION: ORN-related mandibular reconstruction is challenging but can be aided by VSP and 3D-guides. This is the largest series of VSP/3D-surgery for ORN to date. We find acceptable complication rates and high accuracy despite this population's extensive scarring and predisposition to poor wound healing. Pain, trismus and occlusion/jaw alignment are substantially improved. VSP and 3D-guides can greatly facilitate ORN mandibular reconstruction.

A130: OUTCOMES OF TRANEXAMIC ACID IN MICROVASCULAR FREE FLAPS

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Introduction: Tranexamic acid (TXA) is an antifibrinolytic agent that has been shown to be effective in decreasing blood loss and hemorrhagic events in both trauma and surgery. Use of this medication to decrease bleeding has not yet been investigated in microvascular free flaps.

Methods: Prospective cohort study of patients undergoing microvascular free flap was conducted from February to September 2021. Patients who met our inclusion criteria were given 1 g IV TXA prior to skin incision, 1 g IV after flap elevation, topical 3% TXA used at free flap site and resection site prior to closing and 1 g IV TXA during skin closure. This was then compared to retrospectively collected data from microvascular free flap patients from January 2019-2021. Variables collected included type of free flap, hematoma rate, flap failure rate, adverse reactions and other comorbidities including history of bleeding disorders.

Results: A total of 306 patients were included in our study. 72 patients were given TXA. Free flaps included ALT, fibula, radial forearm and parascapular flaps. The hematoma rate in microvascular free flaps in our patients was 8.1 percent (19/234) prior to initiation of TXA protocol and 6.9 percent (5/72) in patients who received TXA (p=.37). Hematoma requiring return to OR was 1.3 percent prior to TXA and 2.8 percent in patients who received TXA (p=0.72). There were no adverse reactions or increase in flap failure rates in this population (2.1 vs 2.7 % in TXA patients, p=0.75).

Discussion: While overall hematoma rate was decreased in patients who received TXA, this was not statistically significant. There was no increase in flap failure rates with administration of TXA. The prospective data collection is ongoing and future studies will focus on short and long-term outcomes of these patients.

A131: HOW PREOPERATIVE PSYCHOSOCIAL STATUS AFFECTS POSTOPERATIVE OPIATE USAGE IN HEAD AND NECK FREE FLAP PATIENTS

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Importance: Previous studies have shown that psychologic conditions are associated with increased perioperative pain in orthopedic surgery. Few studies have been done in otolaryngology. Further inquiry into how the self-esteem, social functioning, and other quality of life measures in routine patients without psychologic conditions affect surgical outcomes are needed.

Objective: To identify if there is an association between pre-operative self-esteem and quality of life with post-operative pain and opiate use in patients undergoing microvascular free flap surgery.

Design, Setting, and Participants: This was a prospective cohort study. The medical health records of patients who required free tissue transfer reconstruction between January to September 2021 were reviewed. Patient sociodemographic and post-operative opiate use were obtained. The Rosenberg Self Esteem Scale and the Short Form 36 was administered pre-operatively. Average postoperative peak pain scores were assessed using a numeric rating scale from 0 – 10 from post-operative days 1-5. In hospital opiate use was converted to morphine milligram equivalents (MME). Analysis of the data was performed using the Fisher exact test, Kruskal-Wallis and Spearman's tests on STATA 15.

Exposures: Free Flap

Main Outcomes and Measures: Rosenberg Self Esteem Scale score, Short Form 36 subset scores, demographic characteristics, peak post-operative pain, in hospital opiate usage

Results: Thirty-one patients (22 male, 9 female, mean [SD; range] age: 59.1 [14.4; 23.1 - 84.9]) who underwent free tissue reconstruction surgery were recruited into this study. Twenty-two patients underwent a radial forearm free flap, while 4 underwent fibula free flap, 4 anterolateral thigh free flap and 1 scapula free flap. The mean peak post-operative pain [SD; range] was 4.6 [2.5, 0 – 10]. The mean opiate usage over 5 days [SD, range] was 8.7 MME [9.2, 0.4 - 45.5]. Six patients (19.4%) required opiates pre-operatively. The mean fatigue sub-score [SD; range] was 69.3 [20.1, 25-100]. Higher pre-operative energy levels were associated

with lower pain scores post-operatively and reduced opiate intake (p = 0.014 and p = 0.048, respectively). Increased preoperative pain scores were correlated with improved post-operative pain (p = 0.017), which could be indicative of acquired pain tolerance. The mean social function sub-score [SD; range] was 76 [25.1, 12.5-100]. Low social function sub-scores may correlate with higher postoperative pain scores (p= 0.09), but need to be confirmed with further study. Mean self-esteem score was not associated with complication rates. Nine patients (29.0%) used marijuana. Interestingly, marijuana usage was associated with increased postoperative pain and opiate usage (p = 0.006 and p = 0.029, respectively). Alcohol, tobacco, and pre-operative opiate use were not associated with post-operative pain.

Conclusion: Increased preoperative energy and pain were correlated with decreased postoperative pain and opiate usage, while decreased social function may be associated with higher postoperative pain scores. Preoperative marijuana use was associated with increase postoperative pain and opiate usage. This study highlights the importance of psychosocial and personal factors in postoperative pain management. Continued enrollment in our study will substantiate our results and identify high-risk characteristics so that higher doses or more frequent administration of opiate alternatives can be scheduled post-operatively.

A132: BENEFIT OF A SUPRAFASCIAL ANTEROLATERAL THIGH FREE FLAP PERFORATOR HARVEST FOR OPTIMAL REPAIR OF COMPLEX HEAD & NECK DEFECTS.

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Background: The anterolateral thigh (ALT) free flap has become a popular reconstructive technique to repair a variety of head & neck defects due to the relative versatility of this site. However, the relative bulkiness of the anterolateral thigh site, as well as the variable perforator anatomy, are often quoted as limitations of this reconstruction potentially limiting its broad applicability. A suprafascial perforator dissection is one potential option for mitigating these limitations, allowing harvest of fasciocutaneous, adipofascial flaps, or chimeric flaps that can be readily thinned to optimize the reconstruction when required. The literature base describing the applicability of suprafascial ALT flap harvest is limited particularly in the North American literature. We present our broad experience with this technique for an array of complex head & neck defects.

Methods/Results: A Retrospective review of free tissue reconstructions at our institution from October 2017 to July 2021 was performed. Eighty-four (84) suprafascially harvested ALT flaps were identified. Flap characteristics (e.g., perforator number, size, and operative time), defect characteristics, flap outcome, and perioperative patient outcomes were collected. Of the 84 suprafasical ALT flaps completed during the study period there were two flap failures leading to a survival rate of 97.6%. Two additional cases, both reconstructing large volume temporal defects, developed significant venous congestion during the first 48 hours post-op, but were salvaged with a combination of antithrombotic and leech therapy. Our patients ranged from 19-88 years old with a median patient age of 62 years old. Suprafascial ALT flaps were utilized for cutaneous, upper aerodigestive, pharyngolarygeal and skull base defects. One notable advantage of the suprafascial harvest technique is elongation of pedicle length making this particularly advantageous for skull base defects of salvage cases.

Conclusion: The suprafascial ALT flap harvest is a safe and effective technique for the reconstruction of head and neck defects. In our opinion it provides a number of advantages over a traditional flap elevation, including customizability of soft tissue bulk, enhancement of pedicle length, and potentially decreased donor site morbidity.

A133: BENEFITS OF PATIENT-SPECIFIC PLATES IN MANDIBULAR RECONSTRUCTION: A PILOT, EX-VIVO STUDY

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Introduction: Postablative mandibular reconstruction techniques continue to evolve to improve oral function and limit long term complications which could severely impact patient's oral function or quality of life. Prior work has demonstrated the association of poorly contoured mandibular reconstruction plates with subsequent complications such as plate extrusion or nonunion. Recently, a technique whereby preoperative patient-specific reconstructive plates are designed, generated, and sterilized has been developed in the hopes of eliminating errors that may arise in the plate-bending process, thereby limiting possible hardware-related complications. The objective of this study is to determine if a reconstruction performed based on a patient-specific 3D-printed plate will result in a more accurate reconstruction compared to one performed based on a manually contoured plate.

Methods: Ten Otolaryngology residents or fellows each performed two ex-vivo mandibular reconstructions based on a virtually planned reconstruction (Figure 1). To control for other confounding elements of the reconstructions, the virtually planned reconstruction, the two unresected mandible, and individual fibular segments were 3D printed. First, participants were given a patient-specific 3D-printed plate and were asked to assemble the reconstruction by securing the mandibular and fibular segments to the patient-specific plate. Next, participants manually contoured a standard titanium plate to the reconstructed model, assembled the fibular segments, and secured the reconstruction with screws. Time taken to perform each step of the reconstruction was recorded. CT scans of the resulting reconstructed models were obtained. Cephalometric and structural accuracy measurements between reconstructed and planned models were determined using MeshLab and 3D Slicer software. Paired Student's t-test was performed on the results in each reconstruction group, so each participant served as their own control.

Results: There was a significant difference between reconstructions that used 3D-printed plates and those that used manually contoured plates with respect to: plate-mandible distance (0.39±0.21 mm vs. 0.75±0.31 mm, p=0.0128), inter-fibular segment gap distance (0.90±0.32 mm vs. 2.24±1.03 mm, p=0.0095), mandible-fibula gap distance (1.02±0.39 mm vs. 2.87±2.38, p=0.0260), average reconstruction deviation distance (1.11±0.32 vs. 1.67±0.47, p= 0.0228), and mandibular angle width difference (5.13±4.32 mm vs. 11.79±4.27 mm, p=0.0221). Additionally, there was a trend towards improved Hausdorff-95 distance (2.10±1.12 mm vs. 3.41±1.47 mm, p=0.0818). As well, a significant time reduction between the two groups in performing the reconstruction was observed (16.67±4.18 min vs 33.78±8.45 min, p=0.0006).

Discussion: Patient-specific 3D-printed plates significantly improved the accuracy of the reconstruction including decreased plate-to-mandible distance and improved bony apposition. Lower plate-mandible distance has been demonstrated to correlate with decreased plate extrusion rates. Similarly, improved bony apposition promote bony union rates. Therefore, printed plates appear to provide a more accurate scaffold to guide the surgeons in assembling donor bone segments, which has the potential to improve patient outcome and reduce surgical time.

Conclusion: The potential of printed plates in improving mandibular reconstruction has been demonstrated and should be further investigated in larger-scale ex-vivo and preclinical testing.

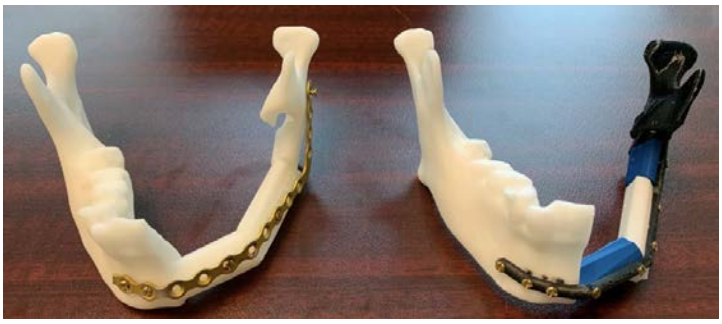

Figure 1: Models of reconstruction using a manually contoured plate (left) and patient-specific 3D-printed plate (right).

A134: HETEROTOPIC OSSIFICATION OF FREE FLAP TISSUE GRAFTS IN HEAD AND NECK RECONSTRUCTIVE SURGERY: A SYSTEMATIC REVIEW

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Objectives: Heterotopic ossification (HO) of free tissue flaps is a post-operative phenomenon where graft vasculature becomes ossified. Osteocutaneous tissue flaps retain periosteum that has osteogenic proliferative potential when transplanted elsewhere in the body. The high mechanical stress in the jaw may stimulate bone remodeling. This study comprehensively reviews the literature on ossification following free flap reconstruction of the mandible and maxilla.

Study Design: Systematic Review of the Literature

Methods: PubMed, Scopus, Web of Science, and CINAHL electronic databases were systematically searched for articles pertaining to HO of free flaps in head and neck surgery. Data on patient demographics, clinical findings, anatomic location of free flap graft, diagnosis for initial reconstruction, follow-up, diagnostic testing, and treatment were analyzed.

Results: A total of 36 peer-reviewed journal articles were included, which totaled 187 individual patients with HO. Of these, eight retrospective reviews reported an 11.3% incidence of HO by weighted average. Four of these retrospective reviews specified the location of reconstruction in 593 cases studied (mandible N=536, maxilla N =57), with their reported incidence of HO as 14.9% in the mandible (N=80) and 38.6% in the maxilla (N=22). Overall, the mean reported age was 52.7 years. Gender was reported in 165 cases and most patients were male (N=126, 76.3%). A total of 128 cases involved the mandible (80%) and 32 cases involved the maxilla (20%). The most common pathologic indication for initial resection was squamous cell carcinoma (60.8%). Fibula (N=183) was the most common donor site, though scapula (N=2) and soft tissue upper extremity (N=2, radial forearm and lateral upper) were also reported. Average time from reconstruction to ossification presentation was 15.4 months (range=1-148 months), without any cases reporting flap failure. Radiation therapy, prior to or following surgical reconstruction, was reported in 61 cases. Presenting symptom was reported in 72 cases and included a firm mass (N=50, 69.4%), pain during mastication (N=5, 6.9%), and trismus (N=13, 18.0%), while 39 were reported as asymptomatic (54.1%). Diagnostic testing, reported in 41 cases, included orthopantomogram (OPG) (N=10, 24.3%), computed tomography (CT) (N=22, 53.6%), positron emission tomography (PET) (N=7, 17.1%), biopsy (N=5, 12.2%), and surgical exploration (N=3, 7.3%). The most common treatment, reported in 42 cases, was surgical resection of the ossified portion (N=25, 59.5%), while 17 cases (40.5%) remained stable without any intervention. Follow-up after resection was reported in only 13 cases, without any documented complications or recurrence.

Conclusions: This study presents the largest systematic review of free flap HO following head and neck reconstructive surgery. This phenomenon was most often reported in middle-aged men. The majority of cases occurred following reconstruction of the mandible secondary to squamous cell carcinoma. Time from free flap reconstruction to presentation of ossification was 15.4 months. Many patients presented with a firm mass, while others were asymptomatic with ossification found incidentally. HO was commonly diagnosed by OPG or CT. Surgical resection of the flap was the most frequently reported treatment.

A135: EVALUATION OF PAROTIDECTOMY DEFECT RECONSTRUCTION: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Importance: Despite the need to restore facial contour, symmetry, and volume following parotidectomy, no consensus exists on the optimal reconstruction method.

Objective: (1) Determine which parotidectomy reconstruction method provides the best aesthetic and complication-free outcome (2) Survey current methods for patient-based outcome measures after parotid reconstruction.

Design: Systematic review and meta-analysis.

Data Sources: Search strategies were created in collaboration with a medical librarian, implemented in multiple databases, and completed in March 2020. Inclusion and exclusion criteria were designed to include studies of adults undergoing superficial or total parotidectomy with reconstruction and assessment of non-facial nerve based aesthetic outcome and associated complications. 358 abstracts were identified, 105 full manuscripts were reviewed in full. The analysis included 43 studies with a total of 1249 patients.

Main Outcomes and Measures: Within included studies, patient or surgeon reported scales were most frequently employed to assess reconstruction. Primary outcomes were

overall and symmetry-specific patient-reported satisfaction. Secondary outcomes were surgeon satisfaction and complications. Reconstruction methods included none, alloderm, sternocleidomastoid (SCM) flap, superficial muscular aponeurotic system (SMAS) flap, other regional flaps, free flap, and free fat graft. Random effects meta-analysis of proportions was performed, and the Freeman-Tukey Double Arcsine method was used to calculate the pooled estimate, or rate.

Results: Overall patient satisfaction was 54% (95% CI 14 – 92) when no reconstruction was performed compared to 86% (95% CI 61 – 100) for SCM, 97% (95% CI 83 – 100) for SMAS, 100% (95% CI 72 – 100) for other regional flap, 100% (95% CI 94 - 100) for free tissue transfer and 100% (95% CI 98 – 100) for free fat graft. Patient satisfaction of symmetry was 30% (95% CI 5 – 63) when no reconstruction was performed compared to 65% (95% CI 17 – 99) for SMAS, 90% (95% CI 61 – 100,) for free tissue transfer, 97% (95% CI 83 – 99) for alloderm, 97% (95% CI 83 - 100) for SCM, 99% (95% CI 91 – 100) for free fat graft, and 100% (95% CI 91 – 100) for other regional flap. Surgeon satisfaction was 61% (95% CI 9 – 100) when no reconstruction was performed, compared to 94% (95% CI 81 – 100) for SCM, and 100% for alloderm (95% CI 72 – 100), other regional flap (95% CI 92 – 100), free tissue transfer (95% CI 93 – 100), SMAS (95% CI 98 – 100), and fat graft (95% CI 97 – 100). Meta-analysis for complications was limited to fistula and sialocele which revealed no significant differences between reconstruction methods.

Conclusions and Relevance: Patient-reported outcomes of satisfaction and symmetry were improved following reconstruction. Patients reported less overall satisfaction with SCM reconstruction and symmetry-specific satisfaction with SMAS reconstruction compared to other techniques. Discrepancy exists between patient-reported and surgeon-reported outcomes, with surgeons reporting improved outcomes compared to patients. Moreover, there is heterogeneity in the non-validated methods used to assess contour, volume, or symmetry following parotid reconstruction. Validated, objective, non-biased tools are needed to determine the optimal approach to facial surgery and reconstruction.

A136: TWO-TEAM VS. SINGLE SURGEON FREE FLAP RECONSTRUCTION OF THE HEAD & NECK: A CASE FOR TEAMWORK & POTENTIAL COST-SAVINGS

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Background: Complex head and neck cancer defects can be reconstructed using free tissue transfer from an out-of-field autologous donor site. A single surgical team can perform both the ablative and free flap reconstructive components of these surgeries in sequence. In recent years, a two-team approach, wherein one surgeon carries out the resection of the tumour and a second surgeon the reconstruction of the defect, has increased in popularity.

Objectives: To investigate the benefit of two surgeon-led teams in operating room efficiency and post-operative outcomes.

Methods: Retrospective series of consecutive head and neck free flap reconstruction at an academic tertiary referral centre between 2015 and 2021. Cases were categorized as single surgeon versus two-team and were compared for disease characteristics, anesthetic and operative time, and post-operative outcomes. Univariate and multivariate statistics were carried out.

Results: Five-hundred seventy-three consecutive free flaps were performed (n= 259 single surgeon, n=314 two-team) during this period. The two-team group was slightly younger (61.1 + 14.9 vs 64.0 + 14.9, p0.026) but otherwise there were no differences in baseline patient demographic or disease characteristics. Chi-squared analysis demonstrated that more fibula free flap reconstructions were done by the two-team group (32.3% vs. 13.5%, p<0.005) and more radial forearm flaps done in the single surgeon cohort (35.3% vs 50.6%, p<0.005). A two-team approach enabled significantly reduced operative and anesthetic times, with reductions of 28.0% and 22.9%, or 96 minutes and 88 minutes, respectively (p<0.0001). There were no significant differences in post-operative complication rates nor length of stay. Multivariate analysis for operative time in all comers showed that virtual surgical planning (OR 0.401 (CI 95% 0.189-0.851) p=0.018), early stage (OR 0.481 (CI 95% 0.253-0.913) p=0.026) and non-malignant lesions (OR 0.289 (CI 95% 0.120-0.695) p= 0.006) were associated with decreased duration of surgery. Conversely, nasopharyngeal and sinonasal primary malignancies conferred significantly longer operating times when compared to all other tumour sites. Similarly, scapular donor flap reconstructions resulted in longer operative times in comparison to anterolateral thigh (OR 3.116 (CI 95% 1.074-9.037) p=0.037) and radial flaps (OR 6.55 (CI 95% 2.96-14.52) p<0.0001), and the fibula flap conferred longer operative times compared to the radial flap (OR 4.78 (CI 95% 2.46-9.28) p<0.0001). Tracheostomy was an independent predictor for increased operative time (OR 15.6 (CI 95% 9.330-26.118) p<0.001), length of stay (OR 1.210 (CI 95% 1.166-1.256) p<0.001) and Clavien-Dindo complications >3 (OR 1.714 (CI 95% 1.081-2.716) p=0.022).

Conclusions: A two-team approach had a robust impact on lowering operative and anesthetic times, despite a higher proportion of bony free tissue transfer. Reducing overall operative time may allow for improved utilization of precious hospital infrastructural resources, personnel and costs.

A137: CONTINUOUS NONINVASIVE NEAR INFRARED SPECTROSCOPY (NIRS) IN FREE TISSUE RECONSTRUCTION OF THE HEAD AND NECK.

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BACKGROUND: Continuous noninvasive near infrared spectroscopy (NIRS) which monitors end-organ flap perfusion has been well-studied in breast reconstruction with some limited use in the head and neck [3]. NIRS technology allows for real-time monitoring, updating tissue oximetry readings every 4 seconds, potentially allowing for earlier detection of decreased perfusion. In the breast literature, viable flaps were found to measure anywhere from the low 40's-99% StO2. Given the variable contour of intraoral reconstruction, signal changes can be challenging to interpret when first implementing the system. Additionally, the StO2 readings can be affected by not only flap perfusion, but also global perfusion.

METHODS: Prospective observational study of 60 patient who underwent free tissue transfer within the head and neck region between December 2018 and April 2020 at our institution.

RESULTS: Of the 58 identified and consented, 46 had flaps with a monitor-able skin paddle (ie non-buried flap). Need for reconstruction varied within the patient population; 37 (80.4%) underwent reconstruction after cancer extirpation, 3 (6.5%) required repair secondary to osteoradionecrosis, and 6 (13.0%) for "other" reasons such as trauma. Soft tissue alone was required in 21 (45.7%) patients while 25 (54.3%) required composite tissue. Radial forearm was used in 10 (21.7%) patients, anterolateral thigh 17 (37.0%), fibular free flap in 13 (28.3%), latissimus 1 (2.2%), posterior tibial flap in 2 (4.3%), ulnar free flap in 1 (2.2%) and 1 (2.2%) inferior epigastric perforator fasciocutaneous free flap. Average StO2 for all flaps was 74%, average StO2 for control (arm) was 80%. There were 6 (13.0%) threatened flaps. There were no flap failures in the study group.

CONCLUSION: NIRS for flap monitoring is a helpful tool in the arsenal of the microvascular surgeon. Interpreting the data in clinical context can lead to improved salvage rates as well as give insight to the overall status of the patient. Free flap reconstruction in the head and neck differs from breast reconstruction in that the average StO2 is higher, thus, paradigms for breast reconstruction cannot be directly correlated with head and neck outcomes

A138: ANTICOAGULANTS AND ANTIPLATELET AGENTS FOR THE PERIOPERATIVE MANAGEMENT OF MICROVASCULAR FREE TISSUE RECONSTRUCTION: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Introduction: Prophylactic anticoagulation is a common practice amongst head and neck microvascular free-flap surgeons despite a lack of evidence suggesting an improvement in flap survival. Additionally, there is little consensus among surgeons on medication choice, dosing, or duration. This systematic review and meta analysis evaluates the current body of literature on routine anticoagulation in head and neck free flap surgery and provides a clear conclusion as to if there is a demonstrated benefit.

Methods: The PubMed, Embase, Web of Science, and Cochrane databases were searched for studies assessing head and neck free flap outcomes with anticoagulation. Results were screened according to PRISMA Statement guidelines, and included articles were evaluated using the NIH Quality Assessment Tool. We used the random-effects model to pool the data and reported odds ratio(OR) with 95% confidence intervals(95%CIs).

Results: A total of 19 studies were included for qualitative review and 14 studies for quantitative review. A total of 3,501 free flaps were included in the meta analysis, of which 57% (n = 1981) received some form of anticoagulation. Subgroups of IV heparin and Dextran-40 were included within the meta analysis. The use of anticoagulation did not have a statistically significant effect on overall flap survival (OR 1.10, 95% CI 0.69-1.74) or incidence of thrombosis (OR 1.17, 95% CI 0.69-1.99). The use of anticoagulation showed a statistically significant increase in the incidence of flap hematoma (OR 2.20, 95% CI 1.33-3.51).

Conclusion: A moderately sized body of literature exists to assess the potential effectiveness of prophylactic anticoagulation on head and neck free flap outcomes, however, this literature is limited by the heterogeneity of the various treatment regimen described. Despite this, prophylactic anticoagulation, on the whole appears to provide little benefit when considering the likelihood of thrombosis formation and associated flap survival rate. Anticoagulation seems to be associated with an increased risk of hematoma formation, which surprisingly did not appear to affect flap failure rate. These conclusions are consistent with previously published literature, which have, however, lacked this review's scope. Given the defects in the literature pointed out, future research would hopefully better standardize the anticoagulation regimen being utilized. Additional work should also focus more carefully on other pertinent outcomes, for example, operating room take back rate (e.g., in a setting of hematoma), hospital length of stay, and overall cost of care.

A140: LONGER ISCHEMIC TIMES ARE NOT ASSOCIATED WITH INCREASED COMPLICATIONS IN MICROVASCULAR FREE TISSUE TRANSFER FOR HEAD AND NECK RECONSTRUCTION

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Background: Microvascular free tissue transfer is the current gold standard in reconstruction of complex head and neck defects, allowing for improved cosmetic and functional outcomes with flap survival rates greater than 95%. Harvest of this tissue requires a period of ischemia between division of the vascular pedicle at the donor site and anastomosis to recipient vessels. Prolonged ischemic time has historically been associated with increased risk of microvascular free flap complications and overall failure due to ischemia/re-perfusion injury and the no-reflow phenomenon. There is limited data in the recent literature regarding the impact of duration of ischemia on flap outcomes as well as a lack of consensus regarding the ideal ischemic time. The purpose of this study is to identify any correlation between ischemic time and flap failure, return to OR rate, intraoperative complications, postoperative complications and length of stay.

Methods: A prospective cohort study of 255 microvascular free flap reconstructions completed in 249 patients. Demographic and comorbidity variables such as sex, age, pathology, disease stage, smoking, radiotherapy history, hypertension, and diabetes mellitus were collected. Additional variables assessed were type of flap, operative time, ischemic time, intraoperative complications and postoperative complications. Our outcomes included complete flap loss, flap dehiscence, infection, and fistula formation within one month of follow up. Statistical analysis including t-test, Fisher's exact test, and Pearson's correlation coefficient were used to identify relationships between ischemic time and complications.

Results: A total of 255 microvascular free flap reconstructions were completed in 249 patients during the study period. Average patient age was 60.8 years (SD = 12.6, range 25-81). There was 181 (71.0%) male and 74 (29.0%) female patients. The majority of patients presented with squamous cell carcinoma (75.9%) and 67.5% of malignancies were stage III or IV. The most common defect reconstructed was the soft tissue of the oral cavity (64.3%), with the radial forearm free flap being the most common free flap used in reconstruction (48.8%). The mean ischemic time was 182.2 minutes (range 61 to 430mins). The mean length of stay was 7.6 days.

There were 12 (4.7%) intraoperative arterial thromboses and 1 venous thrombosis (0.39%) which were identified and revised prior to the completion of the surgical case. The flaps were well perfused after revision. 33 (12.9%) free flaps required a takeback to the operating room: 10 for arterial thrombosis and 12 for venous thrombosis. There was an 88% salvage rate, with 4 flaps lost secondary to an inability to establish perfusion after repeat anastomosis with an overall 98% flap survival rate. 59 (23.1%) patients had post-operative flap complications within one month of follow-up, including wound dehiscence (35/59), infection (3/59) and fistula formation (15/59). Linear regression models showed no association between prolonged ischemia time and flap survival (p=0.107), postoperative complications (p=0.399), OR take-back/revision (p=0.134), and length of stay (p=0.168) on univariate and multivariate analysis.

Conclusion: Based on our institutional experience, prolonged ischemia time alone had no association with an increase in intraoperative or postoperative complications for free tissue transfer in head and neck reconstruction.

A141: OUTCOMES OF OSSEOUS VS SOFT TISSUE FREE TISSUE TRANSFER FOR SKULL BASE RECONSTRUCTION

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Objective: To describe our institutional experience with free flap reconstruction of skull base defects and identify risk factors for reconstructive failure.

Study Design: Retrospective Cohort study

Setting: Single tertiary care center

Methods: All patients undergoing head and neck free flap reconstruction at our institution between March 2007 and June 2021 were assessed for inclusion. Operative notes were reviewed to select for patients who underwent reconstruction for a bony skull base defect with or without a dural defect. Cases were reviewed for patient characteristics, operative variables, and postoperative outcomes. Significance was assessed using chi-square and binary logistic regression analyses.

Results: One hundred and ten patients underwent free tissue transfer for skull base reconstruction at our institution between March 2007 – June 2021. The majority of cases (79.5%) were performed for defects of the anterior cranial fossa. In 62 cases (56.4%), a dural defect was present requiring separate dural repair. Extradural reconstruction was performed using an osteocutaneous free flap in 27 cases (24.5%) while the remainder utilized soft tissue only. The overall rate of surgical complications was 30.9%, including wound dehiscence (21.1%), CSF leak (10.0%), infection (7.3%), and pneumocephalus (3.6%). Reoperation was required in 26.3% of cases. Cases reconstructed with osseous flaps were found to have a significantly lower rate of postoperative CSF leak (0.0% vs 13.3%, p=0.046). Amongst those with a dural defect, postoperative CSF leak was observed in 0 of 10 patients with an osseous flap and 11 of 41 patients with a soft tissue flap (0.0% vs 21.2%, p=0.109). Soft tissue free flaps had a higher rate of wound dehiscence, although not statistically significant (21.1% vs. 14.8%, p=0.356). Free flap reconstruction provided definitive repair in 87.3% of cases where no further operative revision of the skull base was required.

Conclusion: Skull base reconstruction may be reliably performed with free tissue transfer with a similar rate of postoperative complications to other free flap procedures. Osseous free flap reconstruction may offer increased stability in the repair of skull base defects via fixed support of soft tissue resulting in a lower rate of CSF leak in this series.

A142: MULTIPLE SIMULTANEOUS FREE FLAPS - A MULTI-INSTITUTIONAL CASE SERIES

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Background: Multiple simultaneous free flaps are an important tool for head and neck reconstruction of complex defects. As microsurgery has evolved and become more efficient, they are increasingly used for defects involving multiple tissue types or multiple functional areas.

Methods: Fifty patients who received double or triple simultaneous free flaps were retrospectively reviewed. Surgeries were performed by head and neck surgeons at 2 tertiary academic institutions from January 2017 to August 2021. Demographics, surgical details, and follow-up data were collected.

Results: A total of 101 flaps were performed on 50 patients, with 1 patient who received 3 simultaneous free flaps and rest who received 2. The median age was 62.5 (range 19-82) years. Thirty-three (66%) patients were male. Thirty-eight (76%) were white, 10 (20%) were black, and 2 (4%) were Hispanic. Indications for surgery were squamous cell carcinoma (n=36, 72%), adenoid cystic carcinoma (n=4, 8%), sarcomas (n=4, 8%), osteoradionecrosis (n=2, 4%), infection (n=2, 4%), basal cell carcinoma (n=1, 2%) and trauma (n=1, 2%). Defect sites included oral cavity composite resection in 40 (80%), maxillectomy in 13 (26%), pharynx resection in 6 (16%), parotidectomy in 5 (16%), and skull base resection in 4 (10%). Three cases involved cutaneous defects alone (6%). The most common free flap combinations were fibula free flap (FFF) with anterolateral thigh flap (ALT) (n=24, 48%), radial forearm free flap (RFFF) with ALT (n=8, 16%), and RFFF with scapula flap (n = 6, 12%). The median operating time was 12 (range 9 - 18) hours and median length of stay was 10.5 (range 5-28) days. Of 101 total flaps with a median follow up time of 6.5 (range 1-48) months, 99 had full survival (98%). There were 2 instances of postoperative anastomosis revision. Ten (20%) patients experienced postoperative neck infections, 6 (12%) had wound problems requiring surgical revision, and 2 (4%) had donor site infections.

Conclusion: Multiple simultaneous free flaps are a reliable method for complex reconstruction in the head and neck.

Table 1. Flap Combinations

Flap Combination	n	Percent
ALT / Fibula	24	48%
RFFF / Fibula	8	16%
RFFF / Scapula	6	12%
RFFF / ALT	3	6%
Scapula / Latissimus	2	3%
ALT / Scapula	1	2%
Latissimus / Latissimus	1	2%
Fibula / Gracilis	1	2%
Latissimus / Serratus	1	2%
ALT / Femoral Condyle	1	2%
RFFF / Latissimus	1	2%
RFFF / ALT / Fibula	1	2%

POSTER LISTINGS

A144: STACKED FIBULA FLAP FOR TOTAL MAXILLECTOMY RECONSTRUCTION WITH ORBITAL PRESERVATION

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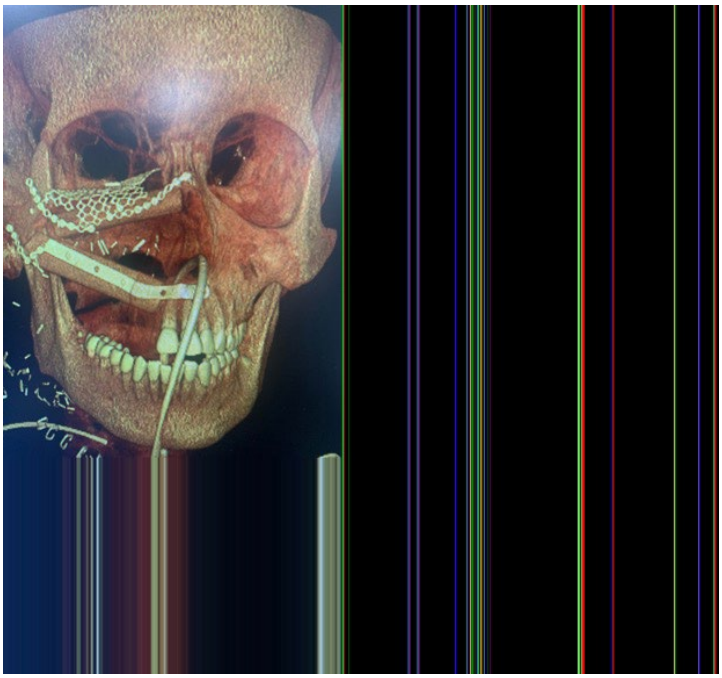
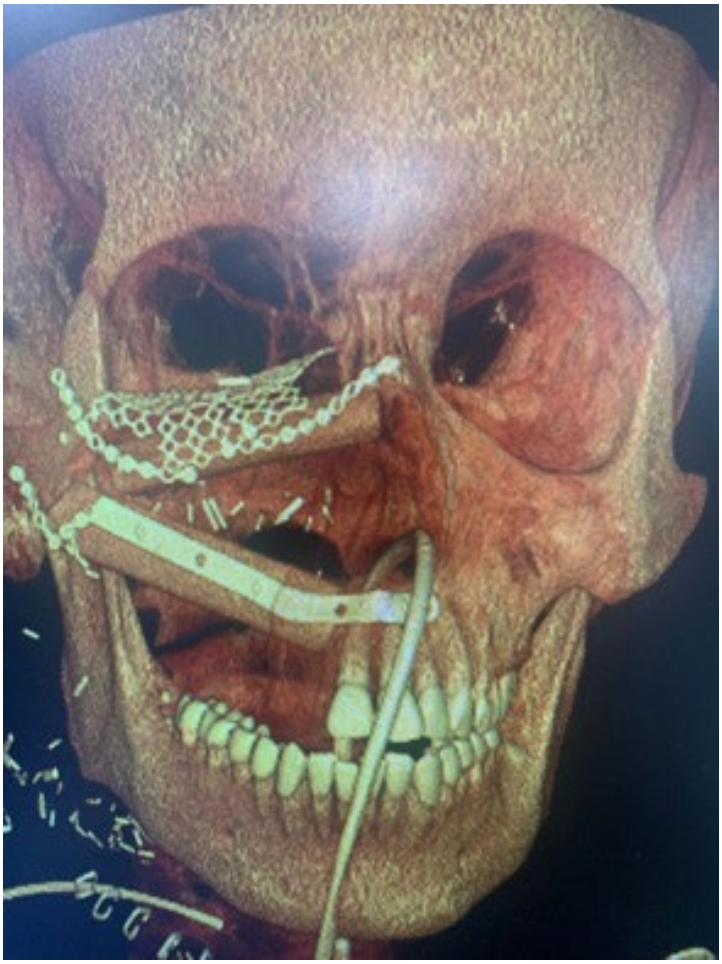
Introduction: Total maxillectomy is indicated for locally advanced maxillary tumors that require complete removal of the midface bony structure and inferior orbital rim. When performed with orbital preservation, reconstruction of this defect can be quite challenging. It is important to consider both aesthetic and functional concerns, specifically midface projection, orbital support, oronasal separation, nasal airway, and oral alimentation. We present a modified method of fibula flap reconstruction that only requires two segments, increasing the ease of harvest and inset.

Methods: A retrospective review of patients at two tertiary care institutions undergoing total maxillectomy reconstruction with a stacked fibula flap from 2018 to 2021 was performed. Each patient's clinical course was reviewed, with attention towards the demonstration of surgical steps with photos.

Results: Nineteen patients underwent stacked fibula flap reconstruction of a total maxillectomy defect. Surgical extirpation was performed for malignancy in most cases (15/19, 79%), and for osteoradionecrosis or benign tumor in 21% (4/19). Patients underwent adjuvant (chemo)radiation therapy as indicated. The complication rate was 32% (6/19), including 2 patients with plate extrusion, 2 flap revisions, and 2 episodes of infection. Ninety-five percent of flaps (18/19) survived, and within 4 weeks, 90% of patients (17/19) were tolerating an oral diet without evidence of an oronasal fistula. No patients experienced long term hypoglobus or diplopia.

Conclusion: We present a modified, reproducible method of fibula flap reconstruction for total maxillectomy that only requires two segments, increasing the ease of harvest and inset, while maintaining positive aesthetic and functional results.





POSTER LISTINGS

A145: TECHNIQUE, OUTCOMES, PEARLS, AND PITFALLS OF AN UNCOMMONLY USED INFRAHYOID FLAP IN THE RECONSTRUCTION OF ORAL CAVITY CANCER DEFECTS.
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Introduction: Local flaps play an important role in the reconstruction of oral cavity cancer defects especially in patients with early-stage tumors. While several local flaps have been described , only handful of them are being routinely used in the era of free flaps. We describe the harvest technique, pearls, and pitfalls including the outcomes of the uncommonly used infrahyoid flap.

Materials and methods: Retrospective case review of all cases performed by a single surgeon in one institute.

Technique: Infrahyoid Flap is an is-landed myocutaeous flap based on the branches of superior thyroid artery and vein with skin paddle based in the lower paramedian area of neck. The flap can be harvested to maximum size of 7 X 3 cms. The elevation of the flap begins at the lower end of the neck with the incision carried down to the subcutaneous tissues. Both Sternothyroid and Sternohyoid muscles are then identified, and their lower end is detached from the sternum. Dissection then proceeds superiorly in a submuscular plane outside the thyroid capsule. As the dissection reaches the upper pole of the thyroid gland, the superior thyroid vascular bundle is dissected close to the upper pole and ligated. Then the sternothyroid detached from the thyroid cartilage and sternohyoid from the hyoid bone. Care is taken not to injure external and internal branches of the superior laryngeal nerves at this point. The flap after separation from the middle raphe is rolled laterally and dissection is followed tracing the superior thyroid artery and vein to their origin from external carotid and internal jugular respectively. Flap can be then tunneled carefully posterior to mylohyoid muscle into oral cavity and inset into the defect such that lower end lies anteriorly and upper end at the posterior aspect of the defect. The skin of the neck is mobilized in a subcutaneous plane and donor site is closed primarily as it is done routinely post neck dissection.

Results: We performed 11 cases of Infrahyoid from Sep 2019 to July 2021. Followup period ranges from 24 months to 3 months with a mean duration of 12 months. Patients' age varied from 32 yrs to 76 yrs and included 8 males and 3 females. The site of defect was buccal mucosa and Oral tongue, in 4 patients each, Lip/Buccal mucosa in 2 patients and inferior maxillary defect in one patient. 2 patients of buccal mucosal cancer also had marginal mandibulectomy.Size of defect reconstructed varied from 3.5 X 3 cm to 7 X 5 cms. None of the patients had prior neck dissection or radiation and 5 patients had N+ disease and concomitant neck dissection was performed in all patients.No complete flap necrosis was seen however one patient had partial flap necrosis due to venous congestion, that did not require any further surgical intervention. All patients had primary closure of donor site and no donor site morbidity was seen.

Conclusion: Infrahyoid flap is safe and reliable alternative in the reconstruction of oral cavity defects especially in early stage tumors.

A147: LONG-TERM OUTCOMES OF CRANIOPLASTY RECONSTRUCTIONS REQUIRING FREE FLAP COVERAGE
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Introduction: Complex scalp wounds with cranial/dural involvement are challenging to reconstruct. Successful reconstruction can be achieved with intracranial implants and free flap coverage. Wounds can breakdown, become infected, and require revision procedures. We addressed long-term reconstructive outcomes of different implants requiring free flaps.

Methods: Multi-institutional retrospective review of 84 patients, 2000-2020, repaired with intracranial implants and free flap coverage.

Results: Long Term: Implant exposure by flap type: latissimus dorsi 25%, other 13%, radial forearm 7.1%, anterolateral thigh 7.1%. Partial/total flap loss: 21% ALT and 15% latissimus dorsi flaps. 73% patients with implant exposure demonstrated partial/total flap loss, p=<0.0001. Implant exposure occurred: 3D modeled 80%, methyl methacrylate/hydroxyapatite 33%, PEEK ceramic 20%, titanium mesh 14%, other 0%. Short-term implant exposure with titanium mesh trended to long-term implant exposure, p=0.17. Flap/implant reconstructions with long-term rates of exposure: radial forearm/methyl methacrylate 100%, latissimus dorsi with titanium mesh/3D modeled/other (20%, 20%, 13%), anterolateral thigh with titanium mesh 9.1%. Patients with long-term implant exposure, 53% demonstrated history of smoking and 40% underwent prior radiation therapy, p=0>0.99. Combinations requiring multiple revisions: radial forearm with methyl methacrylate 100%, anterolateral thigh with titanium mesh 50%, latissimus dorsi with PEEK ceramic/3D modeled/titanium mesh (33%, 25%, 8.3%).

Conclusion: Long-term cranial implant exposure was correlated with partial/total flap loss. Short-term implant exposure was not statistically correlated with long-term implant exposure. Short-term implant exposure may provide clinical indication of future wound complications. Prior smoking and radiation therapy were not associated with implant exposure.

A148: IMPACT OF FRAILTY ON POSTOPERATIVE COMPLICATIONS AND SURVIVAL AFTER FREE FLAP RECONSTRUCTION
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Background: As the population ages, head and neck cancers (HNCs) have increased in incidence and frailty has become an area of interest. Much of the literature on frailty as a predictor of outcomes in HNC surgery utilizes national databases and few studies focus solely on free flap reconstruction (FFR). This study examines the impact of frailty on short-term postoperative outcomes and longer term survival after FFR at a single institution.

Methods: A retrospective review of patients with a diagnosis of HNC who underwent FFR at a single institution from 2015-2021 was performed. Preoperative frailty was assessed using the 11-item modified frailty index (mFI) score and the binary Johns Hopkins Adjusted Clinical Groups (ACG) frailty indicator. Primary outcomes included length of stay (LOS), length of intensive care unit (ICU) stay, unplanned return to the operating room, pneumonia and surgical site infection (SSI) during inpatient stay, discharge location (home vs. skilled nursing facility (SNF)), and

30-day readmission. Secondary outcomes included 2-year overall survival. Patients were excluded if they received salvage surgery. Univariate and multivariate analyses were performed, controlling for age, sex, primary cancer site, stage, prior treatment, and flap type.

Results: Of the 308 patients included for analysis, 103 (33.4%) were classified as frail via the ACG indicator. mFI scores were 0 (31.5%, n=97), 1 (32.8%, n=101), 2 (18.5%, n=57), and 3+ (17.2%, n=53). On multivariate analysis, frailty with an mFI score of 3+ was associated with increased risk of returning to the operating room (p=0.047) and pneumonia (p=0.01). Frail patients were more likely to have longer LOS if they were classified as frail by either scale: mFI score of 3+ (p=0.004) or ACG indicator (p=0.02). Prolonged length of ICU stay was seen in frail patients with the ACG indicator (p=0.038). Likelihood of discharge to a SNF was significantly increased with an mFI score of 3+ (p=0.003) or the ACG frailty indicator (p<0.001). Multivariate analysis showed no significant increased risk for 30-day readmission or SSI in frail patients. 2-year overall survival was decreased in frail patients with an mFI score of 3+ (ref: mFI=0, 69.6% vs. 30.0%, p<0.001).

Conclusions: Frail patients with HNC undergoing FFR are at increased risk for postoperative complications including longer LOS and discharge to SNF. Overall survival is also significantly decreased in these frail patients (mFI score 3+). Assessment of frailty status by mFI or ACG indicator can assist with preoperative risk stratification and patient counseling when considering FFR. Future directions include analyzing the effects of specific comorbidities and factors within these frailty scales to determine areas for pre-operative optimization.

Table 1. Multivariate linear regression results: frailty association with length of hospital and ICU stay.

Frailty Indicators	Length of stay OR (95% CI)	p-value	Length of ICU stay OR (95% CI)	p-value
mFI 0	Ref.		Ref.	
mFI 1	0.9 (0.1-7.5)	0.926	0.8 (0.2-2.6)	0.667
mFI 2	1.9 (0.1-25.3)	0.641	1.2 (0.3-5.7)	0.781
mFI 3+	65.9 (3.9-1118.8)	0.004*	4.7 (0.9-24.4)	0.068
ACG	9.8 (1.4-66.6)	0.020*	3.2 (1.1-9.8)	0.038*

Table 2. Multivariate logistic regression results: frailty association with postoperative complications.

Frailty Indicators	Return to OR OR (95% CI)	p-value	SSI OR (95% CI)	p-value	PNA OR (95% CI)	p-value
mFI 0	Ref.		Ref.		Ref.	
mFI 1	1.0 (0.4-2.8)	0.959	1.6 (0.5-5.8)	0.471	0.7 (0.2-1.8)	0.417
mFI 2	0.5 (0.1-2.2)	0.378	1.4 (0.3-6.9)	0.639	0.6 (0.2-2.1)	0.456
mFI 3+	3.6 (1.01-13.4)	0.047*	3.7 (0.8-19.0)	0.095	4.0 (1.3-12.4)	0.014*
ACG	1.2 (0.5-2.9)	0.676	1.0 (0.-2.8)	0.989	0.8 (0.3-1.8)	0.627

Table 3. Multivariate logistic regression results: frailty association with discharge location and unplanned readmission.

Frailty Indicators	Discharge (home vs. SNF) OR (95% CI)	p-value	30-day readmission OR (95% CI)	p-value
mFI 0	Ref.		Ref.	
mFI 1	1.3 (0.5-3.4)	0.637	3.6 (1.0-17.4)	0.068
mFI 2	2.8 (1.0-8.2)	0.051	3.2 (0.7-18.1)	0.158
mFI 3+	5.0 (17-14.9)	0.003*	2.4 (0.4-15.1)	0.309
ACG	5.1 (2.4-11.0)	<0.001*	0.7 (0.2-1.8)	0.463

A149: MICROVASCULAR RECONSTRUCTION IN THE TIMES OF COVID-19: LENGTH OF STAY AND READMISSIONS

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IMPORTANCE: Enhanced recovery after surgery protocols and decreased length of stay have become a priority for all major surgeries, including microvascular reconstruction of the head and neck, in the era of COVID-19. However, accelerated discharge is not without risks.

OBJECTIVE: Investigate changes in readmission and emergency room visit rate before and after implementation of an accelerated discharge protocol coinciding with the onset of COVID-19.

DESIGN: Retrospective chart review between August 15, 2016 and June 30, 2021 before and after implementation of an accelerated discharge protocol on March 1, 2020. Data were analyzed using non-parametric statistics and logistic regression.

SETTING: A single tertiary care hospital.

PARTICIPANTS: Patients who underwent microvascular reconstruction after oral cavity, oropharyngeal, skull base, salivary gland, and skin resections.

EXPOSURE: Surgery before or after accelerated discharge protocol implementation.

MAIN OUTCOMES: Length of stay (LOS), readmission rate, and rate of return to the emergency room (ER) without readmission.

RESULTS: One hundred and fifty patients were included. 68.7% (n=103) had upper aerodigestive tract reconstruction; 31.3% (47) patients had cutaneous reconstruction. Reconstruction was performed with free flaps from the anterolateral or anteromedial thigh in 75 cases (50.0%), radial/ulnar forearm in 28 (18.7%), fibula in 35 (23.3%), and other locations in 12 (8.0%). Eighty-eight (58.7%) had surgery prior to accelerated discharge and 62 (41.3%) after.

Median LOS was 9 days before accelerated discharge (inter-quartile range [IQR] 7-12) and 5 after (IQR 3-8, p<0.001). Among patients who had upper aerodigestive tract reconstruction, median LOS decreased from 10 days (IQR 8-13) to 6.5 (IQR 5-8, p<0.0001). For cutaneous reconstruction, median LOS decreased from 7 days (IQR 5-8) to 3 (IQR 3-5, p=0.0003). Prior to accelerated discharge, 31.8% of patients were readmitted, compared to 19.4% after (p=0.089). There was no significant change in the percent of patients who visited the ER without readmission (13.6% vs. 4.9%, p=0.077).

Patients who had cutaneous reconstruction were less likely to require readmission (14.9% vs. 32.0% for upper aerodigestive, p=0.028), but rates of return to ER were similar (11.7% vs. 6.4%, p=0.319). There was no significant difference in readmission rate for those who were discharged to a skilled nursing facility or subacute rehabilitation facility (SNF/SAR) (22.7% if discharged home vs. 43.3% for SNF/SAR, p=0.06), but more did return to the ER (6.7% vs. 23.3%, p=0.024).

On multivariate logistic analysis, controlling for age, sex, resection site, insurance status, discharge destination, and surgery pre- and post-discharge acceleration, no factors were associated with readmission. Using the same model with ER visits, patients discharged to SNF/SAR had higher odds of presenting to the ER without readmission compared to those discharged home (OR 4.25, 95% CI 1.11-16.21, p=0.034), and patients with Medicare were more likely to return to ER compared to those with private insurance (OR 9.67, 95% CI 1.76-53.0, p=0.009).

CONCLUSION AND RELEVANCE: There was no increase in rate of readmission or return to the ER without readmission after accelerated discharge protocol implementation, suggesting that shorter length of stay is safe for patients who undergo microvascular reconstruction of the head and neck.

A150: OUTPATIENT PAROTIDECTOMY: SAFETY OUTCOMES, PATIENT CONVENIENCE, AND PATIENT SATISFACTION IN PARTIAL, SUPERFICIAL, AND DEEP LOBE PAROTIDECTOMY

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Background: Superficial parotidectomy has been demonstrated in multiple reviews to be a safe outpatient procedure. Outpatient partial parotidectomy and deep lobe parotidectomy have not been as well studied. At our tertiary care center, the transition from inpatient parotidectomy practice to a largely outpatient parotidectomy practice has allowed for comparative investigation of surgical and patient outcomes. In conjunction with this, our practice cares for a patient population who often travel a significant distance to obtain care, not intuitively lending itself to an outpatient practice.

Objectives: We sought to assess the impact of outpatient parotid surgery on a largely remote patient care population reviewing post-operative parotidectomy outcomes including surgical safety, patient convenience, and patient communication.

Methods: Retrospective chart review of patients undergoing superficial lobe, deep lobe, or partial parotidectomy January 2020 to October 2021. Comparison groups were divided into outpatient parotidectomies and inpatient parotidectomies, with exclusion of patients who underwent neck dissection or total parotidectomy. Surgical complications, placement of drain, timing of drain removal, post-operative prescriptions, post-operative patient communication, modality of clinic visits, and distance traveled by the patient were extracted. A multivariable model examined the relationship between admission status and surgical complications and was adjusted for age and sex. A second model was generated to examine relationship between admission status and post-operative patient communication. Odds Ratios, 95% confidence intervals, and p-values were determined for all comparisons.

Results: 159 patients were included, 94 outpatient (59.1%, median age=52 years) and 65 inpatient (40.8%, median age=53 years). Pre-operatively, 27 patients (17%) were evaluated via video visit. Post-operatively, 137 patients (86%) were evaluated via video visit. Patients traveled a median distance of 172 miles from their home to the hospital with no significant difference in distance between the two groups. Outpatient parotidectomy procedures included: 53 partial, 28 superficial lobe, 6 deep lobe, 1 accessory lobe, and 6 extracapsular dissection. Inpatient parotidectomy procedures included: 25 partial, 28 superficial lobe, 2 deep lobe, 2 accessory lobe, and 8 extracapsular dissection. There was no statistical difference in rates of seroma, hematoma, wound infection, or presentation to the emergency department. There was an increased rate of salivary leak or sialocele reported in the inpatient group compared to outpatient (p=0.01, OR 5.4, 95% CI 1.6 to 18.0). Following discharge, 56% of outpatients and 71% of inpatients initiated communication with the surgical team. There was no significant difference in the number of post-operative patient communications between the inpatient and outpatient groups, but a greater percentage of questions from the outpatient group centered around drain cares and expected wound healing.

Conclusion: Outpatient surgery for superficial lobe, deep lobe, and partial parotidectomies is safe and feasible regardless of a patient's distance from the surgical center. Outpatient status has not increased post-operative complications, nor has it generated more post-operative patient communication. Utilization of telehealth resources and electronic patient messaging may decrease the need for patient travel and improve patient convenience. Implementation of outpatient management and telehealth communication must be balanced with rigorous patient education, specifically highlighting drain removal and typical post-operative wound healing.

A151: DEFINING THE CLINICAL CHARACTERISTICS OF MAMMARY ANALOGUE SECRETORY CARCINOMA OF THE SALIVARY GLAND: ANALYSIS OF THE NATIONAL CANCER DATABASE

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Objectives: Mammary Analogue Secretory Carcinoma (MASC) is a relatively recent classification of salivary gland tumors. Previous descriptions of this diagnosis have largely consisted of case reports and case series with few studies investigating its clinical characteristics as compared to non-MASC tumors. In this study, we aim to use a large patient database to compare and contrast the clinical characteristics of MASC versus non-MASC salivary gland tumors.

Methods: The National Cancer Database (NCDB) was queried for histological diagnosis of MASC (n = 118) and non-MASC (n = 33956) salivary tumors. Various demographic and clinical variables were abstracted and compared using Wilcoxon rank sum and Chi-square tests. Survival was compared between cohorts using Cox proportional hazards regression.

Results: Overall, compared to non-MASC diagnoses, MASC tumors affected younger individuals (age: 52.4 years vs. 63.4 years, $p < 0.001$), displayed favorable pathologic staging (AJCC stage 1: 45.5% vs. 27.1%, $p < 0.001$) and tumor grade (well- to moderately-differentiated: 51.0% vs. 94.6%, $p < 0.001$), and were more likely to be confined to the parotid gland with decreased lympho-vascular invasion (7.4% vs. 23.1%, $p < 0.001$) and higher rates of negative nodal disease at diagnosis (83.5% vs. 61.3%, $p < 0.001$). Patients with MASC tumors also received treatment more quickly following diagnosis compared to patients with non-MASC tumors (17.7 days vs. 19.7 days, $p = 0.002$), with surgery as the primary treatment modality for patients with MASC tumors (98.3% vs. 86.1%, $p < 0.001$). The risk of death was 5.7 times greater for non-MASC

diagnoses, however this hazard ratio had a wide confidence interval (95% CI 0.8 – 40.5) and p = 0.08, when adjusted for patient variables.

Conclusion: Clinically, MASC salivary tumors have a more indolent course compared to non-MASC salivary cancers, and they represent more favorable clinical and pathologic characteristics. Surgery is the primary treatment modality historically favored for this diagnosis with noted favorable survival as compared to non-MASC salivary cancers.

A152: PATTERNS OF RECURRENCE AND METASTASIS IN ADENOID CYSTIC CARCINOMA OF THE SKULL BASE

Peter Lancione, MD; Sarah Nyirjesy, MD; Matthew Old, MD; The Ohio State University Wexner Medical Center

Background: Adenoid cystic carcinoma (ACC) is a rare salivary gland malignancy with high propensity for local recurrence and late distant metastasis to lung, which can be observed up to two decades after initial diagnosis. Skull base invasion has been identified as an independent predictor for poor survival and presents challenges in surgical management. Subsite analyses of ACC are sporadic due to the rarity of the disease, and disease recurrence patterns in skull base ACC have yet to be compared to other sites in the head and neck.

Methods: A retrospective analysis of 193 patients with adenoid cystic carcinoma over a 25-year period was performed to evaluate recurrence and metastasis patterns in primary skull base ACC in comparison to other sites in the head and neck.

Results: Nodal metastasis was more common in the skull base group, though no statistically significant difference was achieved (p=0.1887). Positive margins were detected at a significantly higher rate in skull base primary tumors (79.5% vs 49%, p=0.0003). Skull base primary was associated with shorter overall survival (OS) and disease-free survival (DFS), 58.2- and 43.6-months vs 100.4- and 73.6- months, respectively. Distant metastasis was more common in the skull base group with 34% developing metastatic lesions compared to 25.3% for other sites. The time interval to development of distant metastasis was shorter for skull base primary with median time to metastasis of 32.5 months, and 64.2 months for other sites.

Conclusions: Skull base ACC is an established poor predictor of survival due to difficulty surgical management and propensity for perineural spread along major cranial nerves. Survival intervals were expectedly reduced in the skull base subset. Despite shorter survival, patients with skull base tumors developed distant metastasis at a higher rate than other sites, and in a shorter time from initial diagnosis. Given the indolent nature and typical late metastasis of ACC, one would expect fewer incidences of metastasis in skull base patients as they succumb to local disease more frequently, however this was not the case. It appears ACC of the skull base exhibits more aggressive behavior in both local invasion and hematogenous spread throughout the body. Further research is ongoing to evaluate independent predictors of metastasis in head and neck ACC.

Characteristics	Skull Base	Other Sites
Cases	47	146
Age at Diagnosis	58.3	53.3
Male	44%	46%
Nodal Metastasis	13.3%	7.1%
Tobacco Use	78.7%	68.7%
Margin Positivity	79.5%	49%

Survival and Recurrence	Skull Base	Other Sites
Overall Survival	58.2months	100.4months
Disease-Free Survival	43.6months	73.6months
Local Recurrence	36%	30.1%
Distant Metastasis	34%	25.3%
Local Recurrence Interval	52.2months	61.4months
Distant Metastasis Interval	32.5months	64.2months

A153: POPULATION BASED SURVIVAL ANALYSIS OF SQUAMOUS CELL CARCINOMA OF THE PAROTID GLAND: A SEER DATABASE REVIEW

Nizar Tejani, MD; Runhua Shi, MD, PhD; Ameya Asarkar, MD; LSU Health Shreveport

Background: Parotid squamous cell carcinoma (SCC) is an uncommon entity among salivary gland tumors. Primary SCC of the parotid gland is a diagnosis of exclusion and exceedingly rare; metastatic SCC of the parotid gland from cutaneous malignancies is far more common. Historically, the literature surrounding SCC of the parotid has been limited to single institution studies. However, with the advent of cancer databases, population based data is becoming more available and robust. The objectives of this study were to examine survival outcomes based on treatment and prognostic factors related to survival for primary squamous cell carcinoma of the parotid gland.

Study design: Retrospective study of the Surveillance, Epidemiology, and End Results (SEER) registry.

Methods: We performed a retrospective review on survival outcomes related to squamous cell carcinoma of the parotid gland using the Surveillance, Epidemiology, and End Results Program (SEER). Data regarding patient demographics, tumor characteristics, and treatment was obtained. Univariate Kaplan-Meier and multivariate Cox survival analyses were performed using variables including grouped age, gender, grade, TNM stage, overall stage. Treatment groups used in the analysis included surgery, surgery with postoperative radiation, surgery with postoperative chemotherapy and radiation, and surgery with postoperative chemotherapy.

Results: 3320 patients met inclusionary criteria based on tumor site of the parotid gland and histological diagnosis of squamous cell carcinoma. Mean overall survival was 2.3 years. Apart from histologic grade, all other variables including age, TNM stage, overall stage, and all treatment groups were found to have a statistically significant effect on survival ($p<0.05$). On multivariate analysis (Table 1), advanced age (60+), stage, and female gender were independently shown to decrease survival. Surgery with adjuvant radiation (HR 0.594, CI [0.535-0.659]) and surgery with adjuvant chemotherapy and radiation (HR 0.667, CI [0.561-0.792] were independently shown to increase survival.

Conclusion: This study highlights prognostic factors for survival in squamous cell carcinoma of the parotid gland including age, overall stage, TNM staging, and conventional treatment modalities. Surgery remains the gold standard in the treatment of this malignancy and the literature largely supports the use of adjuvant radiation particularly in advanced stage or in a high-risk subset of patients. Our analysis demonstrates improvement in survival outcomes with not only radiation after surgery but also the addition of chemotherapy to adjuvant radiation therapy postoperatively. This underscores the necessity for further investigation into the role of postoperative chemoradiation therapy in the treatment of parotid squamous cell carcinoma.

Table 1: Clinicopathologic Factors and Treatment of 155 Patients with Carcinosarcoma of the Salivary Glands

Characteristics	All Patients
Total	155 (100)
Age at diagnosis, median ± SD	66 ± 14
Female	63 (41)
Male	92 (59)
Ethnicity	
White	125 (81)
Black	13 (8)
Other	17 (11)
Comorbidity	42 (27)
No comorbidity	113 (73)
Tumor Site	
Parotid	123 (79)
Submandibular	21 (14)
Major salivary glands (not specified)	11 (7)
T Classification	
T0	1 (1)
T1	4 (3)
T2	37 (24)
T3	29 (19)
T4	14 (9)
Unknown	70 (45)
pT Classification	
pT0	1 (1)
pT1	12 (8)

A154: DEFINING NOVEL SUBPOPULATIONS IN HUMAN SALIVARY GLANDS USING SINGLE CELL RNA-SEQUENCING AND INVOLVEMENT IN CANCER PROGRESSION

Takuya Nakagawa, MD, PhD[1]; Jessica Santos[1]; Chanond Nasamran[2]; Sayed Sadat[1]; Koji Ebisumoto[1]; Jinjin Hu[3]; Sebastian Preissl[4]; Theresa Gujo[5]; Vera Vavinskaya[3]; Kathleen M Fisch[2]; Joseph A Califano, MD[5]; [1]Moores Cancer Center, University of California San Diego; [2]Department of Medicine, Center for Computational Biology and Bioinformatics, University of California San Diego; [3]Department of Pathology, University of California San Diego; [4]Center for Epigenomics, Department of Cellular and Molecular Medicine, University of California San Diego; [5]Division of Otolaryngology - Head and Neck Surgery, Department of Surgery, University of California San Diego

Background: Salivary glands have essential roles in maintaining the oral health, mastication, taste and speech, by secreting saliva. From these glands, a wide variety of salivary gland cancers arise including Adenoid cystic carcinoma (ACC), Acinic cell carcinoma (AciCC), Mucoepidermoid carcinoma, etc. Salivary glands are composed of several types of cells, and each cell type is predicted to be involved in the carcinogenesis of different types of cancers. More detailed understanding of salivary glands at the single cell level is important for understanding the molecular mechanisms of salivary gland carcinogenesis. In this study, we performed single cell RNA-seq on human salivary gland samples to clarify the gene expression profile of each complex cellular component of the salivary glands and related these expression patterns to expression found in salivary gland cancers to infer cell of origin.

Methods: Single cell RNA-sequencing (scRNA-seq) method was used to analyze three cases of normal human salivary gland tissue (all submandibular glands). A total of 13,643 cells were used for the analysis, and based on the expression data of each cell, hierarchical cluster analysis was performed using the Seurat R package and visualized in two-dimensional space using Uniform Manifold Approximation and Projection (UMAP). Based on the results of differential gene expression analysis using scRNA-seq results, we identified each cluster-specific marker gene and identified the cell type of each cluster. Furthermore, immunohistochemistry (IHC) for each cluster marker was used to anatomically validate each cell type. Finally, we compared the expression of each cluster marker in each salivary gland cancer of public RNA-seq data.

Results: By scRNA-seq, salivary gland cells were stratified into four clusters. Differential expression analysis classified these clusters into three cell groups: acinar cells, ductal cells, and myoepithelial cells/stromal cells, with two groups of ductal cells. The localization of each cell group was verified by IHC of each cluster marker gene, and one group of ductal cells was found to represent intercalated ductal cells. Furthermore, in comparison with public RNA-seq data of salivary glands cancer, it was found that acinar cell markers were upregulated in acinic cell carcinoma, and some of the ductal cell markers were upregulated in ACC. It was suggested that these results reflect the expression pattern of each derived cell.

Conclusions: Gene expression profiles specific to each cell type were revealed in detail by scRNA-seq and validated by IHC. Cell type expression in specific salivary gland cancer histologies are similar to those found in normal salivary gland populations, indicating a potential etiologic relationship.

A155: PATTERNS OF CARE AND OUTCOME OF CARCINOSARCOMA OF THE SALIVARY GLANDS

Abhinav Talwar, BA[1]; Evan Patel, MD[2]; Fang Zhou, MD[3]; Adam Jacobson[4]; Moses Tam, MD[5]; Babak Givi, MD[4]; [1]Northwestern University, Feinberg School of Medicine; [2]Department of Otolaryngology, University of California at San Francisco; [3]Department of Pathology and New York University Langone Health; [4]Department of Otolaryngology, NYU Langone Health; [5]Department of Radiation Oncology, NYU Langone Health

Objective: Carcinosarcoma of the salivary gland is a rare malignant biphasic tumor. The present study investigates the epidemiology and clinical behavior of carcinosarcoma of the salivary gland using the National Cancer Database (NCDB).

Study design: Historical Cohort Study.

Setting: NCDB.

Subject and Methods: All carcinosarcomas of the salivary glands were selected between 2004 and 2018. Patient demographics, tumor characteristics, treatments and survival were analyzed. Cox regression analysis was performed in surgically treated patients.

Results: We identified 155 patients in the NCDB with carcinosarcoma of the salivary gland. Mean age at diagnosis was 66 years ± 14 years. Most patients were males (92, 59%). Majority were in the parotid (123, 79%), followed by submandibular gland (21, 14%). Majority were high grade (94, 61%) and a significant portion presented with locally advanced disease (T3-4, 75; 48%). However, nodal (35, 22%) and distant (6, 4%) metastases were uncommon. Most common treatment was surgery and adjuvant radiotherapy (82, 53%), followed by surgery and chemoradiation (30, 19%), and surgery alone (28, 18%). With a median follow up of 37 months, the 3-year overall survival (OS) was 57.7% (95% CI, 49.1-67.9%). In univariable analysis, Advanced T stage, N2 disease, and positive margins were associated with worse OS. In multivariable analysis only age (hazard ratio [HR] 1.02; 95% CI, 1.01-1.04; P= 0.009) and T stage (hazard ratio [HR] 2.49; 95% CI, 1.30-4.77; P= 0.006) were associated with survival.

Conclusion: Carcinosarcoma is a rare tumor of salivary glands that frequently presents at a locally advanced stage. In spite of multimodality treatments, the outcomes are poor. In the absence of clinical trial data, these data could guide clinicians in the management of this rare disease.

Table 1: Clinicopathologic Factors and Treatment of 155 Patients with Carcinosarcoma of the Salivary Glands

Characteristics	All Patients
Total	155 (100)
Age at diagnosis, median ± SD	66 ± 14
Female	63 (41)
Male	92 (59)
Ethnicity	
White	125 (81)
Black	13 (8)
Other	17 (11)
Comorbidity	42 (27)
No comorbidity	113 (73)
Tumor Site	
Parotid	123 (79)
Submandibular	21 (14)
Major salivary glands (not specified)	11 (7)
T Classification	
T0	1 (1)
T1	4 (3)
T2	37 (24)
T3	29 (19)
T4	14 (9)
Unknown	70 (45)
pT Classification	
pT0	1 (1)
pT1	12 (8)
pT2	28 (18)
pT3	39 (25)
pT4	26 (17)
Unknown	49 (32)
N Classification	
N0	70 (45)
N1	14 (9)
N2	10 (6)
N3	1 (1)
Unknown	60 (39)
pN Classification	
pN0	64 (41)
pN1	13 (8)
pN2	22 (14)
pN3	0 (0)
Unknown	56 (36)
Clinical stage	
Stages I-II	37 (24)
Stages III-IV	49 (32)
Unknown stage	69 (45)
Pathological stage	
Stages I-II	31 (20)
Stages III-IV	75 (48)
Unknown stage	49 (32)
Tumor grade	
Low grade	5 (3)
High grade	94 (61)
Unknown grade	56 (36)
Lymphovascular invasion	
No invasion	46 (30)
Invasion present	27 (17)
Unknown	82 (53)
Treatment	
Surgery only	28 (18)
Surgery and radiation	82 (53)
Surgery and chemotherapy	3 (2)
Surgery, chemotherapy, radiation	30 (19)
Surgery with unknown adjuvants	8 (5)
Radiation only	1 (1)
Chemotherapy only	1 (1)
Unknown treatment	1 (1)
No treatment	1 (1)
Margins (n = 151 patients who underwent surgery)	
Positive	50 (33)
Negative	87 (58)
Unknown	14 (9)

Table 2: Tumor Stage and Grade at Presentation of Patients with Carcinosarcoma of the Salivary Glands Stratified by Tumor Site

Tumor Site	Stages I-II, No. (%)	Stages III-IV, No. (%)	P Value	Low Grade, No. (%)	High Grade, No. (%)	P Value
Parotid	27 (42)	38 (58)	0.74	4 (5)	71 (95)	0.78
Submandibular	8 (50)	8 (50)		0 (0)	16 (100)	

Table 3: Margin Status of Surgically Treated Patients with Carcinosarcoma of the Salivary Glands Stratified by Tumor Site

Site	Positive Margins, No. (%)	Negative Margins, No. (%)	Unknown Margins, No. (%)
Parotid	37 (31%)	73 (61%)	10 (8%)
Submandibular	11 (52%)	8 (38)	2 (10%)

Figure 1: Selection criteria for survival analysis of patients with Carcinosarcoma

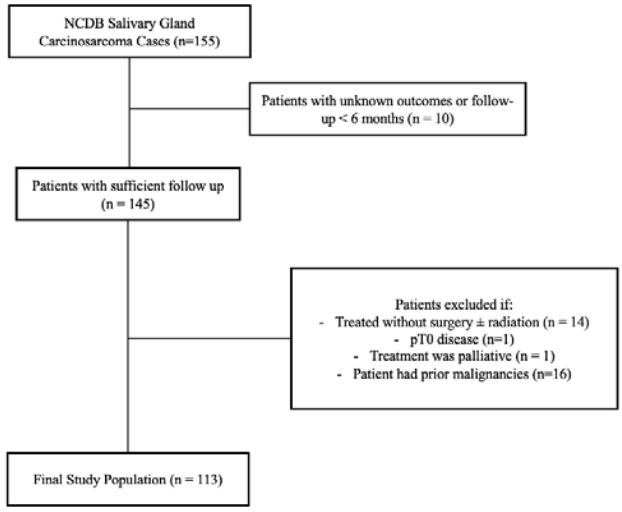


Figure 2: Overall survival of patients with Carcinosarcoma of the salivary gland. The number of patients at risk is shown at the bottom of the graph.

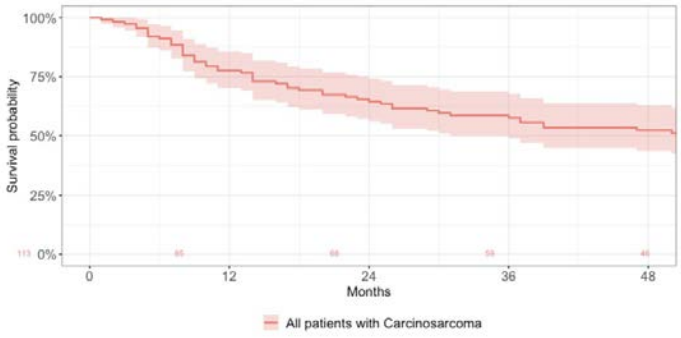


Table 4: Univariable and Multivariable Analyses of Clinicopathologic and Treatment Factors on Survival of Patients with Carcinosarcoma of the Salivary Gland (n=113)

	Univariable			Multivariable		
Characteristic	HR	95% CI	P Value	HR	95% CI	P Value
Age	1.02	1.00-1.03	0.09	**1.02**	**1.01-1.04**	**0.009**
Female sex	0.92	0.55-1.53	0.70	-	-	-
Comorbidity	1.43	0.83-2.48	0.20	-	-	-
Tumor site (reference: Parotid Gland)						
Submandibular gland	1.46	0.76-2.80	0.30	-	-	-
Major salivary gland NOS	1.11	0.35-3.58	0.90	-	-	-
Tumor pathological stage (reference: Stage I-II)						
Stage III-IV	**2.68**	**1.36-5.31**	**0.005**	-	-	-
Unknown Stage	1.71	0.80-3.64	0.16	-	-	-
pT Classification (reference: pT1 or pT2)						
pT3 or pT4	**2.59**	**1.38-4.86**	**0.003**	**2.49**	**1.30-4.77**	**0.006**
Unknown	1.09	0.59-2.01	0.80	**2.19**	**1.06-4.53**	**0.04**
pN Classification (reference: N0)						
pN+	**1.93**	**1.03-3.63**	**0.04**	-	-	-
Unknown	1.05	0.60-1.84	0.87	-	-	-
Tumor grade (reference: Low grade)						
High grade	1.37	0.33-5.72	0.70	-	-	-
Unknown grade	1.40	0.33-5.92	0.60	-	-	-
Lymphovascular invasion (reference: no invasion)						
Invasion present	1.11	0.48-2.54	0.80	-	-	-
Unknown	1.23	0.67-2.27	0.50	-	-	-

Table 4: Univariable and Multivariable Analyses of Clinicopathologic and Treatment Factors on Survival of Patients with Carcinosarcoma of the Salivary Gland (n=113)

	Univariable			Multivariable		
Characteristic	HR	95% CI	P Value	HR	95% CI	P Value
Age	1.02	1.00-1.03	0.09	**1.02**	**1.01-1.04**	**0.009**
Female sex	0.92	0.55-1.53	0.70	-	-	-
Comorbidity	1.43	0.83-2.48	0.20	-	-	-
Tumor site (reference: Parotid Gland)						
Submandibular gland	1.46	0.76-2.80	0.30	-	-	-
Major salivary gland NOS	1.11	0.35-3.58	0.90	-	-	-
Tumor pathological stage (reference: Stage I-II)						
Stage III-IV	**2.68**	**1.36-5.31**	**0.005**	-	-	-
Unknown Stage	1.71	0.80-3.64	0.16	-	-	-
pT Classification (reference: pT1 or pT2)						
pT3 or pT4	**2.59**	**1.38-4.86**	**0.003**	**2.49**	**1.30-4.77**	**0.006**
Unknown	1.09	0.59-2.01	0.80	**2.19**	**1.06-4.53**	**0.04**
pN Classification (reference: N0)						
pN+	**1.93**	**1.03-3.63**	**0.04**	-	-	-
Unknown	1.05	0.60-1.84	0.87	-	-	-
Tumor grade (reference: Low grade)						
High grade	1.37	0.33-5.72	0.70	-	-	-
Unknown grade	1.40	0.33-5.92	0.60	-	-	-
Lymphovascular invasion (reference: no invasion)						
Invasion present	1.11	0.48-2.54	0.80	-	-	-
Unknown	1.23	0.67-2.27	0.50	-	-	-
Treatments (reference: Surgery only)						
Surgery with adjuvant therapy	1.30	0.68-2.51	0.40	1.31	0.65-2.65	0.45
Margins (reference: Negative)						
Positive margins	**1.80**	**1.05-3.07**	**0.03**	1.66	0.95-2.90	0.08
Unknown	2.17	1.00-4.74	0.05	**2.61**	**1.16-5.88**	**0.02**

Results: A total of 6715 patients with cSCCHN underwent surgical excision within hospital stay. Based on HFRS, 74.2 % were in the low risk, 23.7 % in the intermediate risk and 2.1% fell in the high-risk frailty groups. The mean age in the low-risk group (non-frail) was 71.92 years (SD +11.58), 74.14 years (SD 11.75) in the intermediate-risk group, and 76.32 years (SD 9.38) in the high-risk group (p<0.001). Males were predominant in all groups (p=0.509). Caucasians were the predominant population in all the groups. The most common insurance was Medicare across all groups. The mean ECI score (comorbidities) increased significantly across the groups (11.04, 20.30, 24.46), and were significantly different from each other (p<0.001). The mean hospital charges for the low risk group were $ 96,100, whereas the frail group (high risk) was $ 167,140 (p = 0.003).

The death rate was seven times higher in the high-risk frailty group (7.1%) compared to low-risk group (0.5%). Non-home discharge increased with increase in the frailty score. Extended length of stay was present in 64.3% in the high-risk frail group vs 10.9% in the low-risk frail group (10.9%) (p<0.001). 75% of the high-risk frail patients had at least one complication vs 7.1% in the low-risk frail group (p<0.001). Patients with higher comorbidity score (adjusted OR 1.067, 95% CI 1.026-1.109, p<0.001) and frailty score (adjusted OR 1.102, 95% CI 1.042-1.165, p<0.001) had increased odds of in-hospital death, while age and gender did not predict death. ROC curves revealed higher discriminating capacity for frailty compared to age and comorbidity score for all the outcome variables (Fig 1-4).

Conclusion: Our study shows that frailty is an independent predictor that can affect perioperative morbidity, mortality, length of stay, and hospital costs. Classifying patients by their functional status using the frailty scale identifies at-risk patients in the pre-operative clinic and can aid clinicians in counseling patients and families about the hospital course and anticipated complications.

A156: HOSPITAL FRAILTY RISK SCORE IS AN INDEPENDENT PREDICTOR OF OUTCOMES IN CUTANEOUS SQUAMOUS CELL CARCINOMAS OF HEAD AND NECK REGION.

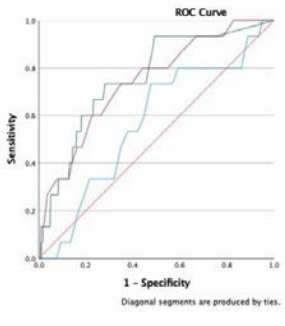
Rema A Kandula, MD; Sandeep Kandregula, MD; Bharat Guthikonda, MD; John Pang, MD; Ameya Asarkar, MD; Cherie-Ann O Nathan, MD; LSU Health sciences Shreveport

Importance: The demographics of cutaneous squamous cell carcinoma of the head and neck (cSCCHN) is marked by a growing number of patients age 65 and over significantly contributing to the overall disease burden in the elderly. Frailty index is a well-studied concept defined by age-related decline in physiological reserve, which could be a reliable clinical assessment tool to provide prognostic information and outcomes thus allowing for improved treatment planning.

Objective: In this study, we explored the effect of frailty on short-term outcomes and hospital costs and compared it with age as an independent predictor through the NIS database.

Materials and Methods: We queried the NIS database for the diagnosis of Cutaneous Squamous cell carcinomas of the Head and Neck region from the years 2016 to 2018 (3 years). Frailty was assessed through Hospital Frailty Risk score (HFRS) which provides a numerical score for each patient. All the patients were categorized as low risk (0-5), intermediate risk (5-15) and high-risk of frailty group (>15). The outcomes analyzed were death in hospital, complications, extended length of stay and non-home discharge.

ROC -Death

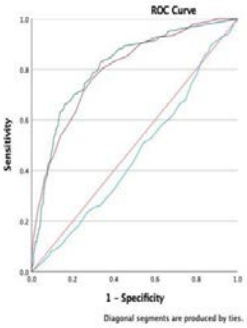


Area Under the Curve

Test Result Variable(s)	Area	Std. Error[a]	Asymptotic Sig.[b]	Asymptotic 95% Confidence Interval	
				Lower Bound	Upper Bound
Age in years at admission	.571	.070	.345	.433	.709
Hospital Frailty Risk score	.758	.060	.001	.640	.877
ECIscore	.742	.063	.001	.618	.865

POSTER LISTINGS

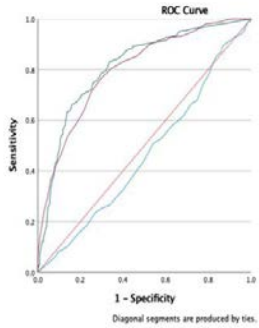
ROC-Extended length of Stay

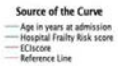


Area Under the Curve

Test Result Variable(s)	Area	Std. Error[a]	Asymptotic Sig.[b]	Asymptotic 95% Confidence Interval	
				Lower Bound	Upper Bound
Age in years at admission	.463	.019	.052	.427	.500
Hospital Frailty Risk score	.811	.014	.000	.783	.838
ECIscore	.798	.014	.000	.770	.826

ROC- Complications

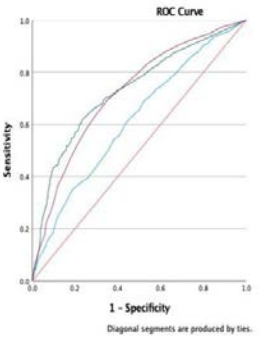


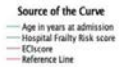


Area Under the Curve

Test Result Variable(s)	Area	Std. Error[a]	Asymptotic Sig.[b]	Asymptotic 95% Confidence Interval	
				Lower Bound	Upper Bound
Age in years at admission	.463	.019	.052	.427	.500
Hospital Frailty Risk score	.811	.014	.000	.783	.838
ECIscore	.798	.014	.000	.770	.826

ROC- Poor Outcome





Area Under the Curve

Test Result Variable(s)	Area	Std. Error[a]	Asymptotic Sig.[b]	Asymptotic 95% Confidence Interval	
				Lower Bound	Upper Bound
Age in years at admission	.616	.015	.000	.586	.646
Hospital Frailty Risk score	.731	.014	.000	.704	.758
ECIscore	.721	.014	.000	.694	.748

A157: THE ARGUMENT FOR ADJUVANT THERAPY FOR STAGE II HEAD AND NECK MELANOMA- COULD A NOMOGRAM ASSIST DECISION MAKING?

Helena Levyn, MD; Schlomo Schneebaum, MD; Tel Aviv Sourasky Medical Center

Background: The sentinel node biopsy (SLNB) in Melanoma has a paramount role in prognostication and staging. Under current guidelines, a positive sentinel lymph node (SLN) makes the patient eligible for adjuvant therapy- either immune checkpoint inhibitors or BRAF-targeted therapies. These valuable therapies have proven to improve Recurrence Free Survival (RFS) in recent and ongoing prospective randomized trials. Management of Head and Neck Melanoma (HNM) raises its own unique challenges due to the area's variable and complex anatomy: The SLN identification rate is significantly lower in the head and neck, reported to be only 84.5%, and the false negative rate is reported to be as high as 29%. These figures suggest we are currently missing a significant portion of HNM patients who might benefit from adjuvant therapy. While clinical trials are currently underway to define the role of adjuvant therapy in high-risk stage II patients, we aim to distinguish which SLN-negative patients, should nonetheless be considered high risk- and potentially eligible for adjuvant therapy.

Methods: By retrieving data from patient records, we established a database of 192 HNM patients who underwent SLNB between the years 1997-2020, in a single large tertiary referral center. Data included clinicophathologic parameters from primary lesion biopsy, SLNB and complete lymph node dissection (if performed). We used two different nomograms to calculate the risk for each of our patients. The older nomogram was developed by Memorial Sloan-Kettering Cancer Center (MSKCC), and has been validated by several groups. The second nomogram was recently suggested by the Melanoma Institute Australia (MIA), and claimed to have an even improved risk prediction. Once a nomogram score has been calculated for each patient, we then used an ROC curve to examine each nomogram individually, analyzing its sensitivity and specificity.

Results: The most common site of HNM was the face (38%), followed by the scalp (29%), in our mostly male population (65%). Locating the SLN necessitated the dissection of a mean number of 1.7 nodal basins (neck levels). Mean time of follow up was 45 months, during which the most common recurrence type was regional. Although the area under the curve for the MIA nomogram was found to be 0.716, it did not show statistical significance (p=0.160). MSKCC's nomogram was statistically significant, with an AUC of 0.687, representing good predictive ability. The cutoff point above which the nomograms were found to have maximal sensitivity and specificity were 32.5% and 4.5% for the MIA and MSKCC nomograms, respectively. Using MSKCC's nomogram, patients who have had recurrence had a mean score of 12.2%, compared to 8.8% score in patients free of recurrence (p=0.03).

Conclusions: The MSKCC nomogram has proven itself useful and of good prognostic ability for head and melanoma. Clinicians should keep the cutoff points found for each nomogram in mind, while making decisions based on these nomograms. As research on adjuvant treatment for stage 2 patients is underway- these nomograms could aid selecting high risk patients fit for adjuvant therapy, even in the absence of a positive SLN.

POSTER LISTINGS

A158: CUTANEOUS SQUAMOUS CELL CARCINOMA IN IMMUNOCOMPROMISED PATIENTS- A COMPARISON BETWEEN DIFFERENT IMMUNOMODULATING CONDITIONS

Ofir Zavdy, MD, MPH; Tara Coreanu, MD; Dvir Bar On, MD; Amit Ritter, MD; Gideon Bachar, MD; Thomas Shpitzer, MD; Noga Kurman, MD; Muhammad Mansour, MD; Dean Ad-El, MD; Uri Rozovski, MD; Gilad Itzhaki, MD; Shani Sherman-Bergman, MD; Limor Azulay-Gitter, MD; Aviram Mizrachi, MD; Rabin Medical Center

Cutaneous squamous cell carcinoma (cSCC) is the second most common skin cancer. The yearly incidence of cSCC in the US is estimated at 200,000-300,000 cases per year. Known risk factors include male sex, age over 50, exposure to ultraviolet light, fair skin, and smoking. Immunosuppression is strongly associated with the risk for cSCC, as previously reported in various studies. Emphasis was often made on solid organ transplant recipients (SOTR). Unlike SOTR, the relations between cSCC and other causes for immunosuppression, have not been thoroughly studied in the past, nor was a comparison made.

Objective: To investigate the clinical features, treatments, and survival rates of immunodeficient patients due to various immunomodulating conditions, and to compare them with immunocompetent controls.

Methods: A retrospective analysis of 465 adult patients, who were treated for cSCC at our institution during 2011-2020. The cohort included 334 immunodeficient patients due to SOTR, chronic lymphocytic lymphoma, leukemia (CLL), systemic lupus erythematosus (SLE), rheumatoid arthritis (RA), psoriasis, and chronic renal failure (CRF), as well as 131 immunocompetent patients with cSCC. The comparative analysis included different outcomes: survival rates, TNM staging, extracapsular extension (ECE), perineural invasion (PNI), positive margins, and rates of multiple cSCC tumors and adjuvant therapy administered.

Results: Among cSCC patients, most were men (73%). The forehead region was the most common site for cSCC, followed by the auricular region and the cheek. The average size of the SCC lesion was 22.9 cm. The recurrence rate was 15%, mostly local and regional. Only 2% were distant metastases. Multiple cSCC tumors were found in 23% of the cohort. Positive margins, perineural invasion, and extracapsular extension rates were 17%, 3.9%, and 3.2%, accordingly. Compared to the controls, immunodeficient patients demonstrated lower survival rates (HR=2.2, p<0.001), increased odds for recurrence (OR=1.7, p=0.04), multiple primary tumors (OR=3.6, p<0.001), and positive margins in pathological specimens (OR=2.4, p=0.009). They were more often treated with adjuvant therapy (OR=1.67, p=0.05). Among immunodeficient patients, a subgroup who were treated with immunomodulating agents demonstrated lower survival rates (OR=1.4, p=0.04). Patients in the SOTR group were diagnosed with cSCC at a significantly younger age and had the lowest survival rates among all other groups. Their average number of tumors was the highest, with a third of the patients having multiple cutaneous tumors (OR=4.8, p<0.001). Their average tumor size was significantly smaller (13.5 cm), compared to other groups. CLL patients demonstrated a significantly higher TNM staging with an average tumor size of 27.4 cm. Their rates of recurrence (OR=2.1, p=0.03), positive margins (OR=4.1, p<0.001), and ECE (OR=3.3, p=0.05) rates were the highest among all groups. Patients with CRF had significantly higher odds for multiple cutaneous tumors (OR=4.7, p<0.001).

Conclusions: Our study provides a comprehensive analysis of the effects of different immunomodulating conditions on cSCC. Survival and recurrence rates, as well as odds for ECE, PNI, and positive margins are significantly affected by immunosuppression. The nature and extent of these conditions of cSCC development vary significantly. Apart from SOTR, CLL and CRF demonstrate significantly worse outcomes compared to other immunodeficient conditions.

A159: A VACCINE FOR SKIN CANCER?: PREVIOUS HPV-POSITIVE CANCER AND HPV VACCINATION ASSOCIATION WITH CUTANEOUS SQUAMOUS CELL CARCINOMA

Susan Kurian, MD; Gauri Shishodia, PhD; Ashley Flowers, MD; Brent Chang, MD, FACS; Cherie-Ann O Nathan, MD, FACS; Ochsner LSU Health Shreveport

Importance: Infection with high risk human papillomavirus (HPV) serotypes is established as a causal factor in development of oropharyngeal and anogenital cancers. The role of HPV in cutaneous malignancies has been studied with conflicting results, and recent reports have described lower incidence of cutaneous squamous cell carcinoma (cSCC) or regression of disease with HPV immunization.

Objective: To investigate the role of HPV vaccination or previous HPV-associated disease on skin cancer prevalence and cancer pathology.

Design: We performed a population based retrospective cohort study using records from over 5 million patients in Louisiana's Ochsner Epic database.

Results: Patients with cSCC were less likely to have been vaccinated to HPV than those without cSCC (OR 0.42, p<0.0001), however HPV testing records between patients with and without cSCC were no different. Pathology records of patients with previous tumors that had undergone p16 testing showed a positive correlation between p16-associated non-cutaneous cancers, p16 results of skin cancers in the same patients, and confirmatory HPV PCR testing of the skin cancer samples. Of note, multiple pre-cancerous lesions also showed HPV positivity within these patients.

Conclusions and Relevance: These results indicate that existing HPV infection could predispose patients to cSCC development and that vaccination to HPV could be protective against skin cancer. Additional population studies will be needed in the future as the prevalence of HPV vaccination increases and the cohort of vaccinated patients increases in age and other risk factors for skin cancer.

THANK YOU TO THE 2022 AHNS SCIENTIFIC PROGRAM SERVICE!

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Vivian Wu, MD, MPH
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Andrea Park
Courtney B. Shires
Andrew Yampolsky

Associate

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Armon Imbriglio
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Patrick Ha	2021-2022	Nolan Seim	2021-2022
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Saad Khan	2021-2022	Akina Tamaki	2021-2022
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Orly Coblens	2021-2024	Nicole Schmitt	2020-2023
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Tabitha Galloway	2020-2023	Madeleine Strohl	2021-2024
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Jeffrey Janus	2021-2024	Rosh Sethi	2021-2024
Ashok Jethwa	2021-2024	Catherine Sinclair	2019-2022
Russel Kahmke	2020-2023	Vanessa Stubbs	2019-2022
Kiran Kakarala	2021-2024	Samantha Tam	2019-2022
Ryan Li	2020-2023	Peter Vosler	2020-2023
Suhael Momin	2019-2022		

PATIENT CARE DIVISION

Value & Quality of Care Service

Vasu Divi, Chair	2021-2024	Carol Lewis	2019-2022
Evan Graboyes, Vice-Chair	2021-2024	Kelly Malloy	2019-2022
Rizwan Aslam	2019-2022	Saral Mehra	2020-2023
Carol Bier-laning	2021-2024	Vikas Mehta	2019-2022
Michelle Chen	2019-2022	Matthew Mifsud	2020-2023
Kevin Contrera	2020-2023	Elizabeth Nicolli	2021-2024
John Cramer	2019-2022	Samip Patel	2020-2023
Deepa Danan	2021-2024	A Daniel Pinheiro	2019-2022
John de Almeida	2019-2022	Seerat Poonia	2021-2024
Laura Dooley	2019-2022	Daniel Rocke	2019-2022
Richard Goldman	2020-2023	Vlad Sandulache	2021-2024
Christine Gourin	2019-2022	Rosh Sethi	2019-2022
Evan Graboyes	2020-2023	Warren Swegal	2019-2022
Trevor Hackman	2019-2022	Samantha Tam	2020-2023
Andrew Huang	2019-2022	Akina Tamaki	2020-2023
Ashok Jethwa	2020-2023	Brittny Tillman	2020-2023
Benjamin Judson	2019-2022	Pratyusha Yalamanchi	2021-2024
Sobia Khaja	2020-2023	Christopher Yao	2020-2023
Amy Anne Lassig	2019-2022		

Practice Guidelines & Position Statements Service

Baran Sumer, Chair	2021-2024	Greg Krempl	2021-2024
Ernest Gomez, Vice-Chair	2021-2024	Ho-sheng Lin	2019-2022
Miriam O`Leary	2021-2024	Giulianno Melo	2019-2022
Virginie Achim	2019-2022	Matthew Miller	2019-2022
Moran Amit	2019-2022	Salem Noureldine	2020-2023
Ofer Azoulay	2021-2024	John Pang	2019-2022
Raymond Chai	2020-2023	Samip Patel	2020-2023
Brent Chang	2019-2022	Guy Petruzzelli	2021-2024
Kazuaki Chikamatsu	2019-2022	Sidharth Puram	2019-2022
Francisco Civantos	2019-2022	Scott Roof	2020-2023
John de Almeida	2021-2024	Michael Sim	2021-2024
Nicole Fowler	2021-2024	Catherine Sinclair	2019-2022
Brendan Gaylis	2019-2022	Shaum Sridharan	2021-2024
Tiffany Glazer	2020-2023	Christopher Vanison	2019-2022
Brianna Harris	2019-2022	Joshua Waltonen	2019-2022
Dev Kamdar	2019-2022	Tracy Wang	2021-2024
Luiz Kowalski	2019-2022	Christopher Yao	2021-2024

AHNS LEADERSHIP

Cancer Prevention Services

Michael Moore, Chair	2021-2024	Nathan Grohmann	2020-2023
Ann Gillenwater, Vice-Chair	2021-2024	James Hamilton	2021-2024
Virginie Achim	2019-2022	Andrew Holcomb	2019-2022
Andrew Agnew	2020-2023	Deepak Kademani	2020-2023
Marco Ayala	2019-2022	Diana Kirke	2019-2022
Andrew Birkeland	2019-2022	Nicole Lebo	2020-2023
Elizabeth Blair	2021-2024	Rachad Mhawej	2021-2024
Brent Chang	2019-2022	Alcides Pinedo	2019-2022
Pankaj Chaturvedi	2020-2023	Phillip Pirgousis	2019-2022
Chih-yen Chien	2019-2022	Brandon Prendes	2020-2023
Andrew Day	2021-2024	Omar Ramadan	2020-2023
Laura Dooley	2019-2022	Eleni Rettig	2020-2023
Heather Edwards	2020-2023	Daniel Rocke	2021-2024
Allen Feng	2021-2024	Jonathan Shum	2019-2022
Tabitha Galloway	2020-2023	Ahmet Tosun	2019-2022
John Gleysteen	2020-2023	Jessica Yesensky	2019-2022
Joseph Goodman	2021-2024	Geoffrey Young	2019-2022
Zhen Gooi	2021-2024	Andrea Ziegler	2021-2024

Survivorship/Supportive Care/Rehabilitation Service

Nishant Agrawal, Chair	2021-2024	Garren Low	2021-2024
Heather Starmer, Vice Chair	2021-2024	Luiz Roberto Medina dos Santos	2019-2022
Evan Graboyes	2021-2024	Matthew Mifsud	2020-2023
Claudio Cernea	2021-2024	Matthew Miller	2019-2022
Pankaj Chaturvedi	2021-2024	Marcus Monroe	2019-2022
Michelle Chen	2020-2023	Marci Nilsen	2019-2022
Orly Coblens	2020-2023	Anna Pou	2020-2023
Barbara Ebersole	2021-2024	Jason Rich	2019-2022
Nicole Fowler	2020-2023	Sagus Sampath	2019-2022
Neerav Goyal	2021-2024	Nicole Schmitt	2020-2023
Kyle Hatten	2019-2022	Anthony Sheyn	2020-2023
Jeffrey Jorgensen	2019-2022	Warren Swegal	2019-2022
Mohemmed Khan	2021-2024	Michael Topf	2019-2022
Diana Kirke	2019-2022	Vilija Vaitaitis	2020-2023
Nicole Lebo	2020-2023	Peter Vosler	2020-2023
Steve Lee	2019-2022	Jessica Yesensky	2019-2022

RESEARCH DIVISION

Basic & Translational Service

Jeffrey Liu, Chair	2021-2024	Daniel Faden	2021-2024
Sufi Thomas, Vice-Chair	2021-2024	Farhoud Faraji	2019-2022
Stephen Lai	2021-2024	Theresa Guo	2019-2022
Clint Allen	2019-2022	Jose Hardillo	2019-2022
Moran Amit	2019-2022	Mark Jameson	2020-2023
Devraj Basu	2021-2024	Young Kim	2019-2022
R. Bryan Bell	2019-2022	Chwee Ming Lim	2021-2024
Andrew Birkeland	2019-2022	Nyall London	2020-2023
Kazuaki Chikamatsu	2019-2022	Adam Luginbuhl	2019-2022
Steven Chinn	2019-2022	Thomas Ow	2021-2024
Joseph Curry	2021-2024	Krupal Patel	2021-2024
Laura Dooley	2019-2022	Phillip Pirgousis	2019-2022

AHNS LEADERSHIP

Basic & Translational Service Cont.

Sidharth Puram	2020-2023	Matthew Spector	2019-2022
Rohit Ranganath	2019-2022	Larissa Sweeny	2019-2022
SrinivasVinod Saladi	2021-2024	Patrick Tassone	2020-2023
Vlad Sandulache	2021-2024	Carissa Thomas	2020-2023
Nicole Schmitt	2021-2024	Jennifer Wang	2019-2022
Travis Schrank	2019-2022	Vivian Wu	2021-2024

Population Health & Clinical Service

Barry Wenig, Chair	2021-2024	Marcus Monroe	2019-2022
Joseph Curry, Vice-Chair	2021-2024	Nitin Pagedar	2021-2024
R. Bryan Bell	2019-2022	Prathamesh Pai	2020-2023
Christopher Britt	2019-2022	Phillip Pirgousis	2019-2022
Michelle Chen	2019-2022	Anna Pou	2019-2022
Kevin Contrera	2020-2023	Sidharth Puram	2019-2022
Vaninder Dhillon	2020-2023	William Reed	2021-2024
Catherine Frenkel	2019-2022	Sagus Sampath	2019-2022
Ryan Jackson	2019-2022	Katelyn Stepan	2021-2024
Kiran Kakarala	2020-2023	Evan Walgama	2021-2024
Diana Kirke	2019-2022	Christopher Yao	2020-2023
Sean Massa	2021-2024	Geoffrey Young	2019-2022
Caitlin McMullen	2020-2023		

Grants Service

Jose Zevallos, Chair	2021-2024	Nyall London	2020-2023
Steven Chinn, Vice-Chair	2021-2024	Adam Luginbuhl	2021-2024
Andrew Birkeland	2019-2022	Matthew Mifsud	2021-2024
Michelle Chen	2020-2023	Rusha Patel	2021-2024
John Cramer	2021-2024	Phillip Pirgousis	2021-2024
Neil Gildener-leapman	2020-2023	Sidharth Puram	2019-2022
David Goldstein	2021-2024	Matthew Spector	2021-2024
Evan Graboyes	2020-2023	Maie St John	2019-2022
Theresa Guo	2019-2022	Carissa Thomas	2020-2023
Katherine Hutcheson	2021-2024	Jennifer Wang	2019-2022
Jeffrey Liu	2019-2022		

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2021-2024

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