



Otolaryngology - Head & Neck Surgery  
UNIVERSITY OF TORONTO

**The 27<sup>th</sup> Annual  
PERCY IRELAND  
ACADEMIC DAY**



**Friday May 11, 2018**

**Hart House, University of Toronto  
Music Room, 2<sup>nd</sup> floor**  
7 Hart House Circle, Toronto

**Percy Ireland Oration**  
by  
**Professor Rodney J. Schlosser, MD**

*ESS: When and How Much?*

**THE DEPARTMENT OF OTOLARYNGOLOGY-HEAD & NECK SURGERY**

*FACULTY OF MEDICINE, UNIVERSITY OF TORONTO*

WELCOMES

**PROFESSOR RODNEY J. SCHLOSSER, MD  
MEDICAL UNIVERSITY OF SOUTH CAROLINA**

THE

**PERCY IRELAND VISITING PROFESSOR**

**MAY 10-11, 2018**

## Professor Rodney J. Schlosser, MD

Rodney J. Schlosser, MD is Professor and Director of Rhinology and Sinus Surgery in the Department of Otolaryngology at the Medical University of South Carolina. He completed his Otolaryngology residency at the University of Virginia and his Rhinology fellowship at the University of Pennsylvania, and has been on staff at MUSC since 2002.

Dr. Schlosser's clinical areas of interest include revision sinus surgery, endoscopic repair of CSF leaks and skull base defects, resection of sinonasal and skull base tumors. His research interests include the mucosal immune response in various forms of chronic sinusitis, novel methods of drug delivery and clinical outcomes in patients undergoing medical and surgical treatment for chronic rhinosinusitis.



Dr. Schlosser has received research grants from the National Institute of Health, Veterans Administration, American Rhinologic Society, American Academy of Otolaryngic Allergy, American Academy of Otolaryngology-Head and Neck Surgery, Cystic Fibrosis Foundation, Johnson and Johnson, Gyrus, Xoran, Acclarent and the Flight Attendant's Medical Research Institute. He has published a textbook on endoscopic sinus surgery, as well as over 200 peer reviewed articles and 7 book chapters and has been an invited speaker throughout the U.S. and abroad.

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## Percy Edgerton Ireland



*Chair 1946 - 1966*

Dr. Ireland was the first full time Professor of Otolaryngology at the University of Toronto. A medical graduate of the University of Toronto, he trained in Otolaryngology with Harris P. Mosher at Harvard. After a distinguished war career, much of it in the Western Desert, he returned to Toronto and was appointed Professor and Chairman in 1946, a position he held, along with that of Otolaryngologist-in-Chief at Toronto General Hospital until 1966. He finished his University career at Sunnybrook Hospital by helping the change over from a Veterans' to a University Hospital. He retired in 1969, leaving

as his legacy a strong academic staff, many of whom held high positions in the University.

He was a tough but a self-effacing man, who started the residency-training program in Otolaryngology. He was extremely active in the educational field and it is fitting that his name be remembered in an academic event for trainees.

## Visiting Professors

1992	1 <sup>st</sup>	Dr. Robert Ruben	New York
1993	2 <sup>nd</sup>	Dr. Noel Cohen	New York
1994	3 <sup>rd</sup>	Dr. Howard Lampe	London, ON
1995	4 <sup>th</sup>	Dr. Lauren Holinger	Chicago, IL
1996	5 <sup>th</sup>	Dr. Derald Oldring	Edmonton, AB
1997	6 <sup>th</sup>	Dr. Clarence Sasaki	New Haven, CT
1998	7 <sup>th</sup>	Dr. Murray Morrison	Vancouver, BC
1999	8 <sup>th</sup>	Dr. Stephen Harner	Rochester, MN
2000	9 <sup>th</sup>	Dr. Dominique Dorion	Sherbrooke, QC
2001	10 <sup>th</sup>	Dr. Richard Mabry	Duncanville, TX
2002	11 <sup>th</sup>	Dr. Melvin Schloss	Montreal, QC
2003	12 <sup>th</sup>	Dr. Jonas T. Johnson	Pittsburgh, PA
2004	13 <sup>th</sup>	Dr. Phillip Wackym	Milwaukee, WI
2005	14 <sup>th</sup>	Dr. Lanny Garth Close	New York, NY
2006	15 <sup>th</sup>	Dr. Richard Chole	St. Louis, MO
2007	16 <sup>th</sup>	Dr. David W. Eisele	San Francisco, CA
2008	17 <sup>th</sup>	Dr. Robin Cotton	Cincinnati, OH
2009	18 <sup>th</sup>	Dr. Douglas Mattox	Atlanta, GA
2010	19 <sup>th</sup>	Dr. Robert Ferris	Pittsburgh, PA
2011	20 <sup>th</sup>	Dr. Ehab Y. Hanna	Houston, TX
2012	21 <sup>st</sup>	Dr. Carol Bradford	Ann Arbor, MI
2013	22 <sup>nd</sup>	Dr. Michael G. Stewart	New York, NY
2014	23 <sup>rd</sup>	Dr. Jonathan Sykes	Sacramento, CA
2015	24 <sup>th</sup>	Dr. Bradley Welling	Boston, MA
2016	25 <sup>th</sup>	Dr. Mark Wax	Portland, OR
2017	26 <sup>th</sup>	Dr. Dan Fliss	Tel Aviv, Israel

## Our Residents

### PGY2



**Neil Arnstead**



**Christopher Hong**



**Florence Mok**



**Christopher Noel**



**Jennifer Siu**

### PGY3



**Joel Davies**



**Mirko Manojlovic Kolarski**



**Frédérick Laliberté**



**Sunita Rai**



**Josie Xu**



**Yael Bensoussan**



**Peter Dixon**



**Weibo Hao**



**Arushri Swarup**



**Yelda Jozaghi**



**Xiao Zhao**



**Patrick Scheffler**



## Research Fellows Presenting



**Fatemeh Hassan Nia**

Medical & Surgical  
Otology/Neurotology  
*University Health Network*  
*(John Rutka)*

## Clinical Fellows Presenting



**Eric Carniol**

Facial Plastic & Reconstructive  
Surgery Fellowship  
*(Peter Adamson)*



**Maya Kuroiwa**

Otology – Skull Base Surgery  
Fellowship  
*Sunnybrook*  
*(Joseph Chen/Vincent Lin)*



**Ahmed Walaa Abousheleib**

Facial Plastic & Reconstructive  
Surgery Fellowship  
*(Oakley Smith)*



**Reuven Ishai**

Medical & Surgical  
Otology/Neurotology  
*University Health Network*  
*(John Rutka)*

# Program

- 8:30 Breakfast & Registration  
9:00 Introduction by Dr. Ian J. Witterick, Chair  
9:05 Opening Remarks

*Each speaker has 7 minutes to make their presentation followed by 3 minutes for discussion*

## **Category 1 - Work undertaken by post-residency research fellows/graduate degree students**

**Session Chaired by Ms. Rosemary Martino**

- 9:10 **Dr. Fatemeh Hassan Nia**  
Audiovestibular Findings in Carbon Monoxide (CO) Poisoning  
*Mentor: Dr. John Rutka*
- 9:20 **Ms. Arushri Swarup**  
Developing Instruments to Facilitate Endoscopic Ear Surgery  
*Mentor: Dr. Adrian James*
- 9:30 **Dr. Peter Dixon**  
Explaining Contemporary Improvements in Adult Cochlear Implant Outcomes  
*Mentor: Dr. Joseph Chen*
- 9:40 **Dr. Xiao Zhao**  
Utilization of Optical Imaging to Define Alterations to Fibrosis  
*Mentor: Dr. Fei-Fei Liu*

## **Category 2 - Work undertaken by PGY2 residents during clinical rotation**

**Session Chaired by Dr. Nikolaus Wolter**

- 9:50 **Dr. Florence Mok**  
PEG Complications in Head and Neck Cancer  
*Mentor: Dr. Antoine Eskander*
- 10:00 **Dr. Neil Arnstead**  
Feedback Frequency in Competency By Design: A Quality Improvement Project  
*Mentors: Drs. Paolo Campisi & Eric Monteiro*
- 10:10-10:30 COFFEE BREAK**
- 10:30 **Dr. Jennifer Siu**  
Minimizing Cost and Radiation Exposure in the Evaluation of Children with Sensorineural Hearing Loss Prior to Cochlear Implantation  
*Mentors: Drs. Sharon Cushing & Blake Papsin*
- 10:40 **Dr. Christopher Noel**  
Radiologic-Pathologic Correlation of Extranodal Extension in Patients with Squamous Cell Carcinoma of the Oral Cavity: Implications for the 8<sup>th</sup> Edition TNM  
*Mentors: Drs. David Goldstein, Jonathan Irish, Eugene Yu & Shao Hui Huang, MSc*
- 10:50 **Dr. Christopher Hong**  
Clinical Applications of 3D Printing in OTL-HNS: A Systematic Review  
*Mentors: Drs. Paolo Campisi, Jonathan Irish, Eric Monteiro, Allan Vescan & Ian Witterick*

**Category 3 - Work undertaken by PGY3 residents during clinical rotation**

**Session Chaired by Dr. Jun Lin**

11:00 **Dr. Joel Davies**  
Quantitative Analysis of Surgical Working Space During Endoscopic Skull Base Surgery

*Mentors: Drs. Jonathan Irish & John Lee*

11:10 **Dr. Josie Xu**  
Effects of Discovery Learning on Medical Students' Knowledge Acquisition and Retention Using a Mobile Otoscopy Simulator: A Randomized Control Trial

*Mentor: Dr. Paolo Campisi*

11:20 **Dr. Sunita Rai**  
Tracheostomy Care: Clinical Practice Patterns of Pediatric OTL-HNS Surgeons Across a Publicly Funded (Canadian) Health Care System

*Mentors: Drs. Reshma Amin, Theresa Holler, Evan Propst & Nik Wolter*

11:30 **Dr. Frédérick Laliberté**  
Comparison of Bone Resorption in Fibula Versus Scapula Tip Free Flap in Mandibular Reconstruction

*Mentors: Drs. David Goldstein & Peter Vosler*

11:40 **Dr. Mirko Manojlovic Kolaski**  
Face Validity, Learning Curve, and Predictive Validity of Virtual Reality Simulator for Sinus Surgery

*Mentors: Drs. John Lee, Eric Monteiro, Allan Vescan*

**11:50-12:50 LUNCH**

12:50 Introduction of Visiting Professor

**12:55 PERCY IRELAND ORATION**

**Dr. Rodney Schlosser**  
*ESS: When and How Much?*

1:40-1:50 Q&A

**Category 4 - Work undertaken by PGY4 residents during clinical rotation**

**Session Chaired by Dr. Antoine Eskander**

1:50 **Dr. Patrick Scheffler**  
Adenotonsillectomy for Obstructive Sleep Apnea in Obese Children: A Systemic Review and Meta-Analysis

*Mentor: Dr. Evan Propst*

2:00 **Dr. Yael Bensoussan**  
In-Office KTP Laser: Complications, Tolerance, and Development of a Safety Protocol

*Mentor: Dr. Jennifer Anderson*

**2:10- 2:30 COFFEE BREAK**

2:30 **Dr. Yelda Jozaghi**  
Investigation of the Impact the Invasive Front Grade in Oral Cavity Squamous Cell Carcinoma

*Mentor: Dr. Douglas Chepeha*

2:40 **Dr. Weibo Hao**  
The Utility of the Resident Clinic as a Teaching Tool for OTL-HNS: A Retrospective Review

*Mentor: Dr. Dale Brown*

**Category 5 - Work undertaken by post-residency clinical fellows**

**Session Chaired by Dr. Jonathan Irish**

2:50 **Dr. Eric Carniol**  
Current Practice Patterns Among  
Rhinoplasty Surgeons: How Closely do they  
Reflect Clinical Practice Guidelines

*Mentor: Dr. Peter Adamson*

3:00 **Dr. Maya Kuroiwa**  
MRI Assessment of SPION Contrast  
In the Inner Ear

*Mentor: Dr. Trung Le*

3:10 **Dr. A. Walaa Abousheleib**  
Biodegradable Implants Application  
In Nasal Septal Surgery

*Mentor: Dr. Oakley Smith*

3:20 **Dr. Reuven Ishai**  
Effectiveness of Vestibular Rehabilitation  
In Patients with Cerebella Ataxia with  
Bilateral Vestibulopathy (CABV)

*Mentor: Dr. John Rutka*

**3:30- 3:50 COFFEE BREAK**

3:50 **PRESENTATION OF AWARDS AND  
PARTICIPATION CERTIFICATES**

Best Paper Category 1  
Best Paper Category 2  
Best Paper Category 3  
Best Paper Category 4  
Best Paper Category 5  
Best Overall Presented Paper

***Plus***

Chapnik, Freeman and Friedberg  
Clinician Scientist Award

The Judy Chauvin Otolaryngology Resident Award

Kris Conrad Merit Award in Facial Plastic Surgery

Freda Noyek Otolaryngology Merit Award

The Shiley E.O. Pelausa Award

The Wharton Head & Neck Research Award

# Abstracts

## Category 1 – Work undertaken by Post-residency research fellows/graduate degree students

**Presenter:** Dr. Fatemeh Hassan Nia  
**Mentor:** Dr. John Rutka  
**Presenter Status:** Post-residency research fellow  
**Presentation Time:** 9:10 am

### Audiovestibular Findings in Carbon Monoxide (CO) Poisoning

**Background:** Carbon monoxide poisoning is one of the rare causes of hearing loss, which may cause reversible or irreversible, unilateral or bilateral hearing loss after acute or chronic exposure. The work place constitutes an important environment when it comes to CO exposure because it is one of the most abundant pollutants in the air, and is present with noise in many work places.

**Objective:** to evaluate the audiovestibular symptoms of patients with CO poisoning and to assess the results of objective findings in these patients.

**Material and methods:** This study is a retrospective review of charts of 12 patients with CO poisoning referred to the tertiary referral neurotology clinic at UHN. The patients were evaluated clinically and auditory and vestibular tests were assessed.

**Results:** The most common otologic symptom was vertigo (83%). The vertigo was reported as light intermittent in 50% of patients while 25% of patients had spinning vertigo. Audiometry showed high frequency sensorineural hearing loss in 50% of patients. 40% of patients showed abnormal results on Caloric test.

**Conclusion:** CO poisoning can cause cochleovestibular loss. Sensorineural hearing loss is a complication, which result from chronic or acute CO exposure, and auditory evaluation of workers exposed to CO is mandatory.

**Presenter:** Ms. Arushri Swarup  
**Mentor:** Dr. Adrian James  
**Presenter Status:** Graduate degree student  
**Presentation Time:** 9:20 am

### **Developing Instruments to Facilitate Endoscopic Ear Surgery**

**Hypothesis and Purpose:** The purpose of this project is to design an instrument to address the challenges experienced during transcanal (or totally) endoscopic ear surgery (TEES). It is hypothesized that an instrument with a steerable tip, and a lumen for suction or to orient a laser fibre, will address these challenges.

**Methods:** A Needs Analysis survey was sent to TEES surgeons internationally to rate their need for better instrumentation to facilitate six different challenges. Based on the results, an instrument was designed and prototyped to reach structures visualized by the endoscope. Four pediatric cholesteatoma cases were identified that were at the limits of reach for TEES. 3D printed anatomy models, derived from segmented patient CT scans, were printed with difficult to reach anatomy highlighted, including the sinus tympani and the supratubal recess. The instrument was then validated inside these models by testing whether the instrument tip could reach the targets.

**Results:** The Needs Analysis survey had 51 respondents and reaching structures visualized by the endoscope yielded the greatest need, median: 90%. Also, a suction enabled instrument was suggested in 11 out of 21 comments. The instrument prototype was able to reach the supratubal recess and sinus tympani in each model. Also a 3D printed patient-derived model, where cholesteatoma had eroded the ear canal like an atticoantrostomy, was used to show that the steerable instrument can reach the boundaries of the antrum. The instrument also has a lumen that can enable suction, or orient a laser fibre to enable these two functionalities at difficult to reach areas.

**Conclusion:** We present a novel tool that can reach into the sinus tympani, supratubal recess and mastoid antrum through TEES atticoantrostomy, addressing a principle limitation of current surgical instrumentation. It is anticipated this tool will allow a greater proportion of pediatric cholesteatoma to be treated with TEES.

**Presenter:** Dr. Peter Dixon  
**Mentor:** Dr. Joseph Chen  
**Presenter Status:** Graduate degree student  
**Presentation Time:** 9:30 am

## **Explaining Contemporary Improvements in Adult Cochlear Implant Outcomes**

**Background:** Cochlear implant (CI) technology has advanced with improvements to receiver/stimulators, processors, and speech processing strategies. Recency of surgery is associated with improved speech perception performance, but the effect attributable to advancements of CI technology is confounded by changes to candidacy criteria and by processor and strategy upgrades that occur over a patient's lifetime.

**Objective:** Determine the relative contribution of technological advancement of receiver/stimulators, processors, and speech processing strategies to improved speech perception outcomes in adult unilateral CI recipients.

**Methods:** Adult (age  $\geq 18$  years) unilateral CI recipients implanted between 1989 and 2017 were identified from an institutional registry. Consonant-Nucleus-Consonant words in quiet (CNC), and Hearing in Noise Test (HINT) sentences in noise (HINTn) testing performed at 3-months, 6-months, 1-year, 2-years, 5-years and every 5 years thereafter were primary outcomes. Implanted receiver/stimulator, processors, and strategies were separately categorized into 4 technological generations by year of market availability and technological differences. Speech performances at all available intervals were estimated with multivariable generalized linear models, accounting for clustering of auditory outcomes within patients and for patient characteristics known to influence speech perception performance. Three separate multivariable models including each technology component were compared by goodness-of-fit to determine their relative ability to predict speech performance.

**Results:** 590 patients underwent a combined 1,927 audiometric assessments including 1,895 CNC and 1,079 HINTn tests. The cohort had a mean age of 60.2 years with 231 (54.4%) females and 104 (17.6%) had pre-lingual deafness. Generation of receiver/stimulator was a better predictor of CNC and HINTn scores than generation of processor or speech processing strategy when accounting for differences in age at implantation, pre-implant best pure tone average, and etiology (QIC 1908.85 for CNC and 1086.21 for HINTn). The most recent generation (4<sup>th</sup>) of receiver/stimulators was associated with a CNC improvement of 4.1% (95% CI 2.5, 5.7) over 3<sup>rd</sup> generation, 6.8% (2.3, 11.3) over 2<sup>nd</sup> generation, and 20.4% (18.2, 22.7) over 1<sup>st</sup> generation receiver/stimulators. Similar effects were noted for HINTn sentences. In sensitivity analyses including only long-term ( $\geq 2$  years) speech outcomes, processor generation was the best predictor of CNC scores and processing strategy was the best predictor of HINTn scores.

**Conclusion:** Technological improvements in receiver/stimulators, processors, and speech processing strategy are associated with improved speech perception outcomes independent of changes in candidacy criteria. Receiver/stimulator generation is the best predictor of early performance, and processor and processing strategy upgrades improve long-term performance.

**Presenter:** Dr. Xiao Zhao  
**Mentor:** Dr. Fei-Fei Liu  
**Presenter Status:** Graduate degree student  
**Presentation Time:** 9:40 am

### **Utilization of Optical Imaging to Define Alterations to Fibrosis**

**Rationale:** Radiation fibrosis (RF) is a long-term side effect of radiotherapy that effects a large proportion of head and neck cancer patients. While it is known that there is considerable morbidity related to the RF, there is a paucity of objective measurements to quantify tissue level dysfunction. Ischemia and alterations to the microvascular system are known to be pathologic changes that contributes to the progression of RF. In this study, it was demonstrated that optical coherence tomography (OCT) may be useful for assessing alterations to the microvascular changes in RF.

**Methods:** Induction of radiation fibrosis in mice was achieved by irradiation with 40Gy single dose to the hind limb. Microvascular changes were assessed by OCT at 6 months post-radiation and were compared to age-matched controls. Histological assessment of vascular changes were performed by image quantification of CD31 stained tissue.

**Results:** OCT quantification of vascular diameter demonstrated a significant loss of small capillaries (<40uM) in RF and a reduction in total vessel number in the papillary dermis. In contrast, RF displayed an increase in proportion of larger diameter vessels, primarily in the reticular dermis. These results were corroborated by image analysis of CD31 stained tissue, which also demonstrated a similar reduction in capillaries with a diameter less than 30 uM with radiation fibrosis.

**Conclusions:** OCT was capable of quantifying alterations to the microvascular system in RF. Future studies will be necessary to assess whether quantified parameters are correlated with patient reported assessment of fibrosis severity. OCT may be a non-invasive tool to assess RF severity and reversal with treatment.



**Category 2 – Work undertaken by  
PGY2 residents during clinical rotation**

**Presenter:** Dr. Florence Mok  
**Mentor:** Dr. Antoine Eskander  
**Presenter Status:** PGY2  
**Presentation Time:** 9:50 am

**PEG Complications in Head and Neck Cancer**

**Background:** Advanced malignancies of the upper aerodigestive tract frequently produce severe dysphagia, necessitating the placement of percutaneous endoscopic gastrostomy (PEG) tubes for enteral feeding in the perioperative period. The most common methods of PEG insertion are the “pull” and “push” methods. One devastating complication of PEG insertion unique to the head and neck cancer population is the development of malignant seeding of the abdominal wall. Previous research has demonstrated stoma metastases when the pull technique is used, but no dedicated studies have examined the rate for the push technique.

**Objective:** To evaluate the rate of stoma metastasis in head and neck cancer patients using the push technique at Sunnybrook Health Sciences Centre (SHSC), in comparison with the rate using the pull technique at the Ohio State University (OSU).

**Methods:** Retrospective chart review of patients with head and neck cancer who underwent PEG insertion in the perioperative period at SHSC and OSU to determine the rate of stoma metastasis following PEG placement. Descriptive statistics will be used to calculate the rate using both techniques.

**Presenter:** Dr. Neil Arnstead  
**Mentors:** Drs. Paolo Campisi & Eric Monteiro  
**Presenter Status:** PGY2  
**Presentation Time:** 10:00 am

### **Feedback Frequency in Competency By Design: A Quality Improvement Project**

**Introduction:** Otolaryngology – Head and Neck Surgery (OHNS) is part of the initial wave of residency training programs in Canada adopting Competency By Design (CBD), a new model of competency based medical education. The University of Toronto OHNS PGY1 residents piloted the CBD model during the 2016-2017 academic year, trialing the use of several Entrustable Professional Activities (EPAs), the task-specific assessments in CBD. The rate of completion of EPAs was monitored and targeted for a quality improvement project.

**Methods:** Residents and faculty participated in a focus group to characterize obstacles in EPA completion, and to engage the stakeholders in the issue. The initial bundled intervention – a set of rules dictating which clinical instance was to be assessed, combined with a weekly reminder from one of the residents to the rest of the cohort – was unsuccessful. The second intervention was a leaderboard, designed on an audit-and-feedback system, that sent a weekly comparison email of each the residents' completion rate from the Program Director's office to all PGY1 residents. The measured endpoint was the number of evaluations per resident per week on OHNS rotation, and response to change was analyzed for statistical significance using control charts.

**Results:** Focus groups of residents and faculty found barriers to EPA completion related to trainee attitudes, supervisor attitudes, and the measurement tool. Motivations for completion were complicated, and interventions were based on intrinsic (resident cohesiveness, competition) and extrinsic (externalizing the decision of when to seek an EPA, deadlines, job obligations) factors. The baseline rate was one EPA completed every four weeks. The leaderboard intervention demonstrated significant improvement, increasing the EPA completion rate to 2.87 evaluations per resident per week.

**Conclusion:** An audit-and-feedback leaderboard system improved the frequency of CBD assessment completion. Resident design of the intervention fostered the necessary engagement for the initiative to succeed. Further study will have to demonstrate the stability and sustainability of this process going forward.

**Presenter:** Dr. Jennifer Siu  
**Mentors:** Drs. Sharon Cushing & Blake Papsin  
**Presenter Status:** PGY2  
**Presentation Time:** 10:30 am

### **Minimizing Cost and Radiation Exposure in the Evaluation of Children with Sensorineural Hearing Loss Prior to Cochlear Implantation**

**Objectives:** There is no consensus on the optimal preoperative imaging in children being evaluated for cochlear implantation. MRI and HRCT are commonly both ordered. While HRCT demonstrates increased bony detail, often this does not change diagnosis or surgical management, and causes unnecessary radiation exposure. Given the redundancy, radiation exposure, and inefficient use of resources of this blanket dual-imaging approach, we developed a new algorithm with the predominant use of MRI, and selective ordering of HRCT. The objectives of the current study were to examine the efficacy of this protocol.

**Methods:** The MRI with selective HRCT radiologic imaging protocol was implemented over a 4-year time period. Patients underwent both MRI and HRCT initially if risk factors were identified on history or physical exam. All other patients were imaged with MRI only, and subsequent HRCT was ordered only if suspicious findings requiring further evaluation were detected on the initial MRI. The results of this protocol were analyzed retrospectively through a review of all imaging and operative reports. Anesthetic exposure and costing information was also obtained.

**Results:** Two hundred and forty (240) patients underwent assessment during the study period. In 8 cases (3.3%) combined HRCT/MRI was performed concurrently based on initial findings during history and physical. MRI only was ordered for 218 (91.3%). In 12 cases (5.0%) HRCT was ordered based on unexpected MRI findings. For the vast majority of cases MRI as a sole modality offered sufficient intraoperative information and there were only two challenging intraoperative cases in this group where the addition of a HRCT may have been useful. Overall, all patients were implanted successfully without complications. Implementation of this protocol led to avoidance of 218 HRCT scans, decreased general anesthesia and decreased resource utilization.

**Conclusions:** MRI alone can be used in the vast majority of cases for preoperative evaluation of pediatric cochlear implant candidates. The need for HRCT to aid in challenging intraoperative cases only occurs in a small number of patients and can be predicted based on risk factors identified on history/physical exam or suspicious imaging findings on initial MRI. This paradigm shifting protocol has the potential to reduce healthcare costs, harmful radiation, and general anesthesia exposure in children.

**Presenter:** Dr. Christopher Noel

**Mentors:** Drs. David Goldstein, Jonathan Irish, Eugene Yu & Shao Hui Huang, MSc

**Presenter Status:** PGY2

**Presentation Time:** 10:40

### **Radiologic-Pathologic Correlation of Extranodal Extension in Patients with Squamous Cell Carcinoma of the Oral Cavity: Implications for the 8<sup>th</sup> Edition TNM**

**Purpose/Objective:** To evaluate the accuracy and prognostication of radiologic extranodal extension (rENE) versus pathologic ENE (pENE) in oral cavity squamous cell carcinoma (OSCC) patients.

**Materials/Methods:** A retrospective review was conducted for all newly diagnosed OSCC that underwent neck dissection in our institution from 2010-2015 with available pre-operative CT or MR. Two head and neck neuro-radiologists reviewed the presence of rENE (defined as 'ill-defined lymph node borders') on imaging independently, blinded to the pathology report. The impact of imaging-surgery interval, imaging modalities, and intra-rater/inter-rater concordance of rENE were assessed. The diagnostic accuracy of rENE versus pENE were evaluated. Overall survival (OS) was compared between those with and without rENE. Multivariable analysis (MVA) evaluated the prognostic value of rENE.

**Results:** Among the 508 patients, rENE and pENE were identified in 57 and 121 cases, respectively. The diagnostic accuracy of rENE versus pENE was identical (73%) for cases with the imaging-surgery interval  $\leq 4$  (n=276) and 4-8 weeks (n=207) but lower (48%) for those  $> 8$  weeks (n=25). CT displayed higher accuracy on rENE assessment vs. MR (80% vs 63%, p=0.011). Inter-rater and intra-rater concordance (n=93) was good ( $\kappa=0.79$ ) and excellent ( $\kappa=0.94$ ), respectively. Excluding the 25 cases with  $> 8$  weeks imaging-surgery interval, the sensitivity, specificity, positive-predictive-value, and negative-predictive-value of rENE versus pENE in the remaining 483 cases were 52%, 96%, 93%, and 66%, respectively. Patients with rENE (n=55) had inferior OS versus without rENE (n=202) and both were lower than node-negative (n=226) patients (3-year OS: 31% vs 68% vs 81%, p<0.001). MVA, adjusted for age, T-category, N-category, and performance status, confirmed the prognostic value of rENE for OS (HR 3.3, 95% CI 2.4-5.3 p<0.001).

**Conclusions:** This large cohort study shows a high specificity but low sensitivity of rENE for pENE. Similar to pENE, the presence of rENE is associated with reduced survival in OSCC.

**Presenter:** Dr. Christopher Hong

**Mentors:** Drs. Paolo Campisi, Jonathan Irish, Eric Monteiro, Allan Vescan & Ian Witterick

**Presenter Status:** PGY2

**Presentation Time:** 10:50 am

### **Clinical Applications of 3D Printing in OTL-HNS: A Systematic Review**

**Objectives:** Medical 3D printing, the fabrication of hand-held models from medical images, has the potential to become an integral part of Otolaryngology-Head & Neck Surgery (Oto-HNS) with broad impact across its sub-specialties. We review the basic principles of this technology, and provide a comprehensive summary of reported clinical applications in the field.

**Methods:** Standard bibliographic databases (MEDLINE, EMBASE, CINAHL, Web of Science, and The Cochrane Central Registry for Randomized Trials) were searched from their inception to November 2016 for the terms: “3D printing”, “three-dimensional printing”, “rapid prototyping”, “additive manufacturing”, “computer aided design”, “bioprinting” and “biofabrication” in various combinations with the terms: “Otolaryngology”, “Head & Neck Surgery” and “Otology”. Additional articles were identified from the references of retrieved articles. Only studies describing clinical applications of 3D printing were included.

**Results:** Of 5,285 records identified through database searching, 66 articles were included for qualitative synthesis. Widespread implementation of 3D printing in Oto-HNS is still at its infancy. Nonetheless, it is increasingly being utilized across all Oto-HNS sub-specialties from preoperative planning to design and fabrication of patient-specific implants and surgical guides. An emerging application considered highly valuable is its use as a teaching tool for medical education and surgical training.

**Conclusions:** As technology and training standards evolve and as healthcare moves towards personalized medicine, 3D printing is emerging as a key technology in patient care in Oto-HNS. Treating physicians and surgeons who wish to stay abreast of these developments will benefit from a fundamental understanding of the principles and applications of this technology.

### Category 3 – Work undertaken by PGY3 residents during clinical rotation

**Presenter:** Dr. Joel Davies  
**Mentors:** Drs. Jonathan Irish & John Lee  
**Presenter Status:** PGY3  
**Presentation Time:** 11:00 am

#### **Quantitative Analysis of Surgical Working Space During Endoscopic Skull Base Surgery**

**Background:** The trans-sphenoidal endoscopic approach has widely been accepted as standard practice for accessing many tumors of the skull base. Over the years, varying approaches have been described to improve visualization and maximize working space within the sinonasal corridor. Specifically, the approach may include a limited or wide posterior septectomy and partial resection of one or both middle turbinates. No study to date has quantitatively assessed the improvement in the overall distance of working space, and distance between instruments/endoscope with these various maneuvers. Our study sought to calculate these measurements and determine the sequential quantitative improvement in working space.

**Methods:** Following placement of fiducial markers, cone beam computed tomography (CT) scans of four cadaveric heads were obtained for registration of an optical tracking system with calibrated tracked endoscope and pointer. The nasal sill was defined as the primary reference point for all measurements. Each head was sequentially dissected: (1) sphenoidotomy and limited posterior septectomy, (2) unilateral middle partial turbinectomy, (3) bilateral middle partial turbinectomy, and (4) wide posterior septectomy. After each subsequent dissection, the maximal craniocaudal and mediolateral distance (mm) and angle (degrees) reached by an optical tracker was calculated at the level of the sphenoid face and sella. In two specimens, an additional measurement of the distance between the pointer and the tip of the endoscope was calculated. Statistical analysis was completed using SPSS 17.0.

**Results:** With each subsequent dissection, a significant improvement in access, both craniocaudal ( $17 \pm 3$ ;  $20 \pm 3$ ;  $22 \pm 10$ ; and  $22 \pm 5$  mm) and mediolateral distances ( $21 \pm 3$ ;  $24 \pm 3$  mm;  $26 \pm 3$ ; and  $29 \pm 5$  mm), was observed at the level of the sphenoid face ( $p < 0.05$ ). This same effect was observed at the level of the sella in the mediolateral dimension ( $23 \pm 4$  vs.  $20 \pm 4$  mm;  $p < 0.05$ ) with wide posterior septectomy, but not for uni- or bilateral middle turbinectomy. A small increase in the craniocaudal and mediolateral angles was observed at the level of the sphenoid face and sella with each subsequent dissection, but did not reach significance. A significant improvement in the mean distance between the optical tracking pointer and endoscope (sphenoid:  $47 \pm 10$  mm; sella:  $72 \pm 8$  mm) was found when a wide posterior septectomy was performed compared with limited posterior septectomy (sphenoid:  $18 \pm 2$  mm; sella:  $37 \pm 5$  mm) ( $p < 0.001$ ). This effect was not observed for either uni- or bilateral middle turbinectomy.

**Conclusion:** Compared with limited posterior septectomy, resection of uni- or bilateral middle turbinates, and/or performing a wide posterior septectomy, maximizes access for working at the level of the skull base. In addition, a wide posterior septectomy will enhance the field of view by permitting a greater distance between working surgical instruments and the endoscope.

**Presenter:** Dr. Josie Xu  
**Mentor:** Dr. Paolo Campisi  
**Presenter Status:** PGY3  
**Presentation Time:** 11:10 am

### **Effects of Discovery Learning on Medical Students' Knowledge Acquisition and Retention Using a Mobile Otoscopy Simulator: A Randomized Controlled Trial**

**Background:** Portable educational technologies, like simulators, afford students the opportunity to learn independently. A key question in education, is how to pair self-regulated learning (SRL) with direct instruction. We employed a cloud-based portable otoscopy simulator to compare two curricula involving SRL. Pre-clerkship medical students used a prototype smartphone application, a 3D ear attachment and an otoscope to complete either otoscopy curriculum.

**Methods:** Forty medical students were recruited and randomized to two curriculum designs. The "Discovery then Instruction" group received the simulator two weeks before a traditional didactic lecture, while the "Instruction then Discovery" group received it after the lecture. To assess participants' ability to identify otoscopic pathology, we used a 100-item test at pre-intervention, post-intervention and 2-week retention time points. Secondary outcomes included time spent using the device and a survey on learning preferences.

**Results:** All participants' knowledge scores improved, regardless of intervention. There was no statistically significant difference in test score improvement between two groups. The Discovery then Instruction group used the device for average  $21.5 \pm 26.3$  minutes and the Instruction then Discovery group used it even less at  $12.5 \pm 18.22$  minutes. The students preferred the Instruction then Discovery learning sequence and most all students felt the greatest barrier to usage was that they "did not have enough time".

**Conclusions:** Both curricular sequences led to improved knowledge scores with no statistically significant knowledge differences. When given minimal guidance, students used this intervention for a very short amount of time. There is value in SRL in simulation education, and we plan to further improve our curricular design by considering learner attitudes and barriers identified in this study.

**Presenter:** Dr. Sunita Rai

**Mentors:** Drs. Reshma Amin, Theresa Holler, Evan Propst & Nik Wolter

**Presenter Status:** PGY3

**Presentation Time:** 11:20 am

### **Tracheostomy Care: Clinical Practice Patterns of Pediatric OTL-HNS Surgeons Across a Publicly Funded (Canadian) Health Care System**

**Objectives:** To investigate variability in pediatric tracheostomy tube care practice patterns and access to resources across Canada.

**Methods:** Canadian pediatric otolaryngologists-head & neck surgeons reported their own practice patterns for children with chronic tracheostomy tubes using a web-based, 29-item multiple choice and short answer questionnaire. Domains investigated included tracheostomy team membership, inpatient care practices, caregiver education, homecare resources, speech and communication, and completeness of emergency tracheostomy kits.

**Results:** The response rate was 86% (38/44). Most respondents care for children with tracheostomy tubes as part of an inter-professional team (n=25/36; 69%) and arrange routine follow-up with a speech and language pathologist (n=22/36; 61%). However, the majority (n=23/34; 68%) of respondents do not formally reassess caregiver competencies (i.e. CPR, emergency tracheostomy care). Notably, respondents were also unsure of how frequently Shiley tracheostomy tubes should be washed and reused with the majority (n=15/36; 41.7%) reporting never and 36% (n=13/36) being unsure. Most (n=15/36; 41.7%) respondents were also unsure of reuse recommendations for Bivona tracheostomy tubes. One third (n=12/36; 33%) of respondents were unsure about government-funded homecare services being provided in their community to children with tracheostomy tubes.

**Conclusion:** There is much variability in pediatric tracheostomy tube care practice patterns across Canada. Results suggest that an evidence-based Canadian clinical practice guideline may help to streamline care provided to Canadian children with tracheostomy tubes.



**Presenter:** Dr. Frédérick Laliberté  
**Mentors:** Drs. David Goldstein & Peter Vosler  
**Presenter Status:** PGY3  
**Presentation Time:** 11:30 am

### **Comparison of Bone Resorption in Fibula Versus Scapula Tip Free Fla in Mandibular Reconstruction**

**Objective:** To evaluate the bone resorption of fibula and scapula tip free flap reconstruction of mandibular defects over time in patients with both benign tumors and malignant tumors that require postoperative radiation therapy.

**Design, Setting, and Participants:** A retrospective cohort review of patients with mandibular defects requiring osseous reconstruction at a tertiary referral academic center from August 2006 to May 2015 were evaluated.

**Main Outcomes and Measures:** Bone area (cm<sup>2</sup>) was calculated immediately postoperatively and over a year later. The percent change in area was compared between fibula and scapula tip free flaps. Data was also substratified by post-surgical radiation treatment.

**Results:** A total of 22 and 42 patients underwent mandibular reconstruction with fibula and scapula tip flaps, respectively. Malignant tumors comprised 81% of the reconstructive cases using fibula and 78% of cases using scapula tip. The percent bone resorption was 13% for fibula flaps at an average of 12 months postoperatively and 4.4% for scapula tip flaps ( $p = 0.052$ ) at an average of 20 months postoperatively. Stratification by postoperative radiation therapy demonstrated no difference in bone resorption between fibula ( $n = 5$ ; 8.5%) versus scapula tip ( $n = 25$ ; 6.3%) reconstruction. However, there was a significant difference between resorption of fibula (24.4%) versus scapula tip (1.6%) in non-radiated patients ( $p < 0.0001$ ).

**Discussion:** Bone resorption as measured by area is more pronounced in fibular than scapula tip free flap reconstruction of mandibular defects, and this is independent of post-operative radiation therapy. The amount of bone resorption is important for potential osseointegrated dental implants and overall cosmesis. The scapula tip flap offers stable bone with minimal donor site-related morbidity, and should be considered for mandibular reconstruction.

**Presenter:** Dr. Mirko Manojlovic Kolaski  
**Mentors:** Drs. John Lee, Eric Monteiro, Allan Vescan  
**Presenter Status:** PGY3  
**Presentation Time:** 11.40 am

## **Face Validity, Learning Curve, and Predictive Validity of Virtual Reality Simulator for Sinus Surgery**

**Introduction:** Endoscopic sinus surgery is nuanced and technically challenging for novice trainees. With modern resident duty limitations and an increased focus on quality metrics in education and beyond, it is important to develop alternative tools for teaching this skill. Neurotouch is a validated high-fidelity virtual-reality simulator that provides haptic feedback and visual cues to simulate sinus surgery. Implementing the simulator in the era of competency based curriculum has not been thoroughly investigated. In this study, we determined the learning curve for three tasks on the Neurotouch and assessed the Neurotouch as a learning tool compared to standard practice during cadaveric endoscopic sinus surgery.

**Methods:** Residents were randomized to virtual reality (VR) or control arms. Residents (PGY 1-4) in the VR arm completed 7-8 sessions on the Neurotouch. Each session consisted of two practice tasks (sphenoid endoscopy and polypectomy) and an evaluation task (endoscopic sinus surgery). Residents in the control arm did not have access to adjunctive tools. Participants were evaluated on performance metrics on quality, efficiency, and safety. They received immediate feedback following the simulation, displayed as a score out of 100 with points gained for successfully performing the task and points lost for errors. These scores were aggregated to calculate the learning curve for each of the tasks. After a washout period residents in VR and control arms were evaluated during a cadaveric endoscopic sinus course.

**Results:** In the first task, the average time to completion of endoscopy for the first, third, and eighth attempts were 123.2 +/- 41.7, 67.0 +/- 49.2, and 36.8 +/- 13.8 seconds respectively, with no significant change in overall points. There was significant improvement between the first and third ( $p=0.05$ ) attempt, which was sustained during the eighth ( $p=0.001$ ) attempt. The variance between trainees also narrowed with successive practice attempts. In the polypectomy task, there was also no significant difference between the average scores for the first, seventh, and eighth attempt. Evaluation task scores on first attempt, seventh, and eighth attempt were 28.6 +/- 19.5, 68.8 +/- 8.4, and 72.3 +/- 8.9 respectively. The change from first to seventh and first to eighth attempt was 40 +/- 20.4 ( $p=0.09$ ) and 45 +/- 12.9 ( $p=0.09$ ).

**Conclusions:** In its current virtual reality iteration, there was a significant improvement in time-to-completion after three sessions, which was maintained through further attempts. The polypectomy task did not show a significant change in overall scoring. This may be due to the simplicity of the task and high average scores at first attempt. For the evaluation task, there was an increase in average score from first to last attempt, which approached but did not reach significance. This learning curve data will assist with implementing the Neurotouch as part of a simulation curriculum for novice trainees prior to spending time in the operating room. Further evaluation of the efficacy of the simulator in improving surgical skill and qualitative measures is pending.

**Category 4 – Work undertaken by  
PGY4 residents during clinical rotation**

**Presenter:** Dr. Patrick Scheffler

**Mentor:** Dr. Evan Propst

**Presenter Status:** PGY4

**Presentation Time:** 1:50 pm

**Adenotonsillectomy for Obstructive Sleep Apnea in Obese Children: A Systemic Review and Meta-Analysis**

**Background:** Adenotonsillectomy is a highly effective first line treatment for obstructive sleep apnea (OSA). However, recent studies suggest a reduced efficacy of this intervention in obese children. The current study aims to pool the data from the current literature to estimate the efficacy of adenotonsillectomy for OSA in obese children.

**Methods:** A retrospective literature review from 1995 to 2017 was performed. Ten studies with 408 children met criteria and were included. Baseline demographics as well as pre- and postoperative sleep study results were extracted from these studies and meta-analyzed.

**Results:** Following adenotonsillectomy OSA resolved in 171 children (42.14%). The mean apnea hypopnea index (AHI) improved from 22.89 to 8.14 postoperatively ( $P < 0.001$ ). The mean oxygen saturation nadir (SaO<sub>2</sub>) improved from 78.43 to 86.97 following adenotonsillectomy ( $P < 0.001$ ). No significant heterogeneity was found across studies.

**Discussion:** Compared with success rates in nonobese children, adenotonsillectomy was found to be less successful at resolving OSA in obese children. However, a significant reduction in AHI and SaO<sub>2</sub> still resulted from this procedure. These results imply that adenotonsillectomy is useful in this patient population to reduce OSA severity, but is less likely to serve as single modality cure.

**Presenter:** Dr. Yael Bensoussan

**Mentor:** Dr. Jennifer Anderson

**Presenter Status:** PGY4

**Presentation Time:** 2:00 pm

### **In-Office KTP Laser: Complications, Tolerance, and Development of a Safety Protocol**

**Objective:** To review complications, tolerance and procedural care for in-office laryngeal KTP laser procedures and present an institutional safety protocol.

**Methods:** A retrospective institutional review was conducted of the first two years of in-office laser (KTP) procedures at St Michaels Hospital, following the application of a standardized safety protocol. The protocol includes, pre-, peri-, and post-procedural care, safety laser measures, as well as monitoring of vital signs, local anesthesia dosage, laser settings, energy dispersed and lasering time. Primary outcomes included complications and patient tolerance. Secondary outcomes included procedural measures such as hemodynamical changes, local anesthetic dosages, laser settings, total lasering and procedure time, and need for pre-medication.

**Results:** 145 in-office KTP procedures performed on 65 patients were reviewed. The overall complication rate was 4.8%. No major complications were encountered. Minor complications included vasovagal responses, and equipment dysfunction. The rate of patient intolerance leading to an aborted procedure or incomplete procedure was 13.1%. Procedural measures compilation showed these procedures necessitate significant doses of local anesthesia (mean= 172.9mg of lidocaine), high level of dispersed laser energy (mean = 261.2 Joules) and long procedure time (mean = 48.3minutes). Pre-medication with lorazepam was used for 16.6% of the procedures. No significant desaturation occurred. In terms of hemodynamic change, there was 13.8 % of significant decrease in blood pressure (BP), 11.7% of significant decrease in heart rate (HR), 5.5% of increase in BP and 6.9% of increase in HR. These changes were clinically significant (symptomatic) in only 4.1% of the procedures.

**Conclusion:** Endoscopic KTP laser procedures for laryngeal disorders can be used safely as an in-office procedure and a detailed standardized protocol is essential to promote patient safety.

**Presenter:** Dr. Yelda Jozaghi  
**Mentor:** Dr. Douglas Chepeha  
**Presenter Status:** PGY4  
**Presentation Time:** 2:30 pm

## **Investigation of the Impact the Invasive Front Grade in Oral Cavity Squamous Cell Carcinoma**

**Background:** Immune cells in the tumor microenvironment modulate outcome in many different tumor types. This study seeks to establish whether the presence of immune cells *at the invasive front* in oral cavity squamous cell carcinoma (OCSCC) is associated with pattern of recurrence and survival.

**Methods:** Diagnostic H/E slides of OCSCC resection specimens were retrieved for 303 consecutive patients. Histological characteristics of the tumor invasive front were reviewed by a pathologist. Patterns of invasion, host inflammatory response, number of mitoses, nuclear polymorphism, and degree of keratinization were graded. Associations between patterns of differentiation were evaluated by Spearman correlation. Time-to-event outcomes were determined by univariate and multivariate Cox regression.

**Results:** The presence of immune cells were weakly but significantly correlated to the increased keratinization ( $r_s=0.24$   $p<0.0001$ ), less nuclear pleomorphism ( $r_s=-0.18$   $p=0.0014$ ), fewer number of mitoses ( $r_s=-0.20$   $p=0.0005$ ), and less aggressive pattern of invasion ( $r_s=-0.25$   $p<0.0001$ ). Notably, the presence of immune cells at the invasive front compared to weak or absent immune cells was associated with better recurrence free survival (82% CI 66-90%) vs (68% CI 62-73%) with a HR 1.41  $P=0.04$ . A strong inflammatory response was also associated with a higher rate of distant control (83 % CI 78-87%) vs (96% CI 84-99%) with HR 1.75  $p=0.024$  on multivariate analysis.

**Conclusion:** The presence of immune cells at the invasive front is associated better recurrence free survival and fewer distant metastases for patients with OCSCC.

**Presenter:** Dr. Weibo Hao

Mentor: Dr. Dale Brown

Presenter Status: PGY4

Presentation Time: 2:40 pm

### **The Utility of the Resident Clinic as a Teaching Tool for OTL-HNS: A Retrospective Review**

**Objectives:** The resident clinic model has been widely used in post-graduate medical education. There is a growing body of literature supporting the validity of the resident clinic model in preparing senior residents for independent practice. The purpose of this study is to evaluate the utility of the resident clinic as a teaching tool for General Otolaryngology.

**Methods:** In this single-centre retrospective chart review, new patients were identified from the senior resident clinic at the Sunnybrook Health Sciences Centre from Jan 1, 2017 to Dec 31, 2017. For each patient, the demographic data, wait time, diagnosis, length of follow up, and investigation/intervention performed were assessed.

**Results:** A total of 130 new patients were identified. Of these, 37.2% were referred by ER physicians, 36.2% by family physicians, and 26.2% by other specialists. The mean wait time was  $29 \pm 27$  days. The presenting complaints were broad, involving all subspecialties in OTOHNS. The most common diagnoses were otology-related (53.8%). Only 31.5% of patients required follow up, ranging from 6 to 358 days (mean:  $31 \pm 71$  days), and 17.7% required referral to other specialists.

**Conclusion:** The resident clinic provides senior OTOHNS residents an independent clinical experience to consolidate and practice their knowledge in General Otolaryngology while improving access to care for patients with OTOHNS concerns.

**Category 5 - Work undertaken by  
Post-residency clinical fellows**

**Presenter:** Dr. Eric Carniol  
**Mentor:** Dr. Peter Adamson  
**Presenter Status:** Post-residency clinical fellow  
**Presentation Time** 2:50 pm

**Current Practice Patterns Among Rhinoplasty Surgeons: How Closely do they Reflect Clinical Practice Guidelines**

**Importance:** Clinical practice guidelines (CPG) are created and released by various medical organizations in order to promote evidence-based recommendations. The AAO-HNS published a CPG for rhinoplasty surgery. We wished to assess how closely the recently released rhinoplasty practice guidelines reflect the current practice patterns of active rhinoplasty surgeons.

**Objective:** This study examines the practice patterns of active rhinoplasty surgeons, looking at the work-up and management of rhinoplasty patients. We then examined how closely active surgeons' practice patterns match the clinical practice guidelines published by the American Academy of Otolaryngology – Head and Neck Surgery.

**Design, Setting, and Participants:** A 159-item questionnaire was developed to assess current perspectives and practices of participants at the Advances in Rhinoplasty Meeting, held in Chicago, Illinois, from May 4-7, 2017. Participants at the meeting were asked to complete the electronic survey which was made available to them through SurveyMonkey.

**Main Outcomes and Measures:** Comparisons were made between the practice patterns of active rhinoplasty surgeons and the action statements of the Clinical Practice Guideline.

**Results:** 131 participants completed the questionnaire. Greater than 80% of respondents agreed with the clinical practice guidelines regarding the level of importance of communicating expectations to the patient, assessment of medical comorbidities, analysis of nasal airway obstruction, and need for patient education regarding the postoperative recovery period. There was moderate discrepancy between the surgeons' practices and the CPG regarding postoperative pain management as well as counseling pertaining to perioperative obstructive sleep apnea management. There was significant discrepancy between the active rhinoplasty surgeons and the CPG recommendations regarding the use of postoperative antibiotics, systemic corticosteroids, and nasal splints.

**Conclusions and Relevance:** Medical practice is an art and a science that should continually evolve towards improvements in patient-care quality and outcomes. The significant discrepancy between some of the clinical practice guidelines established by the AAO-HNS and active surgeons attending the most advanced rhinoplasty course in the world are identified and discussed. As physicians and surgeons dedicated to providing the best care to our patients every day, we must advocate for our patients and provide them with what is in their best interest. Sometimes we are guided towards that end through clinical practice guidelines, but sometimes we must individualize the care to our patient's needs and our surgical techniques. The degree of concordance of current surgeons with the CPG reinforce that the CPG does not uniformly represent the "current standard of care" but does provide guidance for practicing evidence-based medicine based on the currently available evidence.

**Presenter:** Dr. Maya Kuroiwa  
**Mentor:** Dr. Trung Le  
**Presenter Status:** Post-residency clinical fellow  
**Presentation Time:** 3:00 pm

## **MRI Assessment of SPION Contrast in the Inner Ear**

### **Learning objectives**

At the conclusion of this presentation, the participants should be able:

1. Understand the MRI features of the inner ear
2. Recognize SPIONs as a novel contrast agent for imaging of the inner ear
3. Explore the efficiency of magnetic targeting as a delivery method to the inner ear

**Objectives:** Use of superparamagnetic iron oxide nanoparticles (SPIONs) as an effective contrast agent in magnetic resonance imaging of the inner ear.

**Methods:** Long Evans rats were injected with investigative SPIONs by surgical delivery into the left middle ear by a post-auricular approach to the bulla, and subsequent deposit of SPIONs onto the round window niche. The animals were subjected to magnetic targeting in order to deliver the SPIONs into the inner ear and Magnetic Resonance Imaging was subsequently performed. Regions of interest were drawn on coronal sections, at different cochlea turns. The signal intensity of the treated ear was calculated for each level relative to the same location in the untreated ear. Hearing was evaluated using Auditory Brainstem Response (ABR); performed before and after magnetic delivery. Finally the cochleas were collected for hair cells and spiral ganglion neurons count.

**Results:** Decreased signal intensity was observed in the SPIONs treated cochlea of all rats compared to untreated ear. The signal decrease was seen in the perilymph leaving the endolymph in the scala media with bright signal. In the rats treated with magnetic targeting, there was a further small Relative Signal Intensity (ROI) decrease at the apex of the cochlea ( $0.80 \pm 0.15$ ), which was not observed in the group without magnetic targeting. A significant signal decrease in the vestibule was also observed in all animals on the treated side only. Hearing was confirmed normal before and after the procedure.

**Discussion/Conclusion:** Imaging of the inner ear remains a challenge due to its fluid-filled compartments and blood-labyrinth barrier. Different agents have been tested in the recent years and SPIONs appears as a potent T2 negative contrast agents *in vivo*, as seen in this study. Importantly, we were able to use magnetic targeting to improve the penetration of the contrast nanoparticles into the inner ear without compromising the cochlear hearing function.



**Presenter:** Dr. A. Walaa Abousheleib  
**Mentor:** Dr. Oakley Smith  
**Presenter Status:** Post-residency clinical fellow  
**Presentation Time:** 3:10 pm

### **Biodegradable Implants Application In Nasal Septal Surgery**

Septoplasty surgery is one of the commonest procedures performed by Otolaryngologists. Septoplasty surgery has a failure in the literature of 20-50 %. The more sever the deviation of the septum, the higher the failure rate has been a commonly noted observation by surgeons. Factors commonly thought to increase the failure rate revision surgery, location of the deviation, type of deviation and surgeon's skill and experience. Multiple techniques have been described by many authors to manage septal deviations. They can be classified into the following broad categories: suture techniques, excision techniques, cartilage reshaping techniques and the use of implants (bony, cartilaginous and synthetic implants). The surgical approach used include the endoscopic, endonasal, open and extracorporeal septoplasty. A new technique using an absorbable implant (Synthes rapid reabsorbable fixation system) is shown. The technique will be discussed in detail; current indications, outcomes, complications could be encountered will be discussed.

**Presenter:** Dr. Reuven Ishai  
**Mentor:** Dr. John Rutka  
**Presenter Status:** Post-residency clinical fellow  
**Presentation Time:** 3:20 pm

## **Effectiveness of Vestibular Rehabilitation in Patients with Cerebella Ataxia with Bilateral Vestibulopathy (CABV)**

**Objective:** To evaluate the benefit of vestibular rehabilitation (VR) in management patients with Cerebellar Ataxia with Bilateral Vestibulopathy (CABV).

**Background:** CABV is a rare degenerative syndrome with impairment of compensatory eye movement reflexes (vestibulo-ocular, smooth pursuit, optokinetic) causing postural and gait instability. The benefit of VR in CABV patients has not been established.

**Methods:** A retrospective review was performed on a cohort of fourteen patients who were diagnosed with CABV in a multidisciplinary neurotology clinic and participated in VR. All patients included in the study completed their suggested course of VR. The following clinical measures were assessed before starting and after finishing VR: 1) Dizziness Handicap Inventory (DHI), 2) Dynamic Gait Index (DGI), 3) The Activities-Specific Balance Confidence (ABC) Scale 4) number of falls, 5) Positive Affective Negative Affective Score (PANAS), 6) Modified Clinical Test of Sensory Interaction in Balance, condition four (MCTSI-B, eye closed, foam surface), 7) Dynamic Visual Acuity (DVA) test, and 8) gait speed (ft/sec).

**Results:** Following VR, patients were found to have improved balance on MCTSI-B (8 vs 19 seconds,  $p=0.017$ ) and a reduced number of falls (10 vs. 3 falls,  $p=0.02$ ). No statistically significant improvements were seen in DHI, DGI, ABC, PANAS, DVA and gait speed ( $p>0.05$ ).

**Conclusions:** CABV patients who underwent VR were found to have a reduction in the number of falls and better postural stability. However, VR was not found to improve patients' overall subjective perception of their symptoms (DHI, PANAS) or their gait stability (gait speed, DGI, ABC).

### **Learning objectives:**

- 1) Report clinical measures (gait impairment, postural instability, falls) from a relatively large cohort of patients with CABV
- 2) Assess the efficacy of vestibular rehabilitation in a rare clinical condition with both bilateral and central vestibular impairment