

HEAD & NECK INSTITUTE INNOVATIONS

A PUBLICATION FOR PHYSICIANS
WINTER 2020/2021



THRIVE IS A SAFE VENTILATION
TECHNIQUE DURING
MICROLARYNGEAL SURGERY

P. 8

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From the Chair

This has been a year unlike any other. As the new Chair of Cleveland Clinic's Head & Neck Institute, I want to celebrate the accomplishments our team of specialists have achieved and the challenges overcome during these unprecedented times. As we look to the future, I am eager to lead the institute as we seek to build on our past and current success. We believe now is the perfect time to make a pivot, with a renewed focus on innovation and growth.

After 18 years at Johns Hopkins University, I decided to take the leap and come to Cleveland Clinic because I believe in the promise of the Head & Neck Institute. Cleveland Clinic is a world-class healthcare institution with a global reach. There is more of a focus on clinical excellence here than at probably any other academic medical center in its tier. Its focus on clinical excellence, on valuing excellent surgical care and on outcomes really intrigued me.

The second reason that I decided to come to Cleveland Clinic was because of the core value around innovation. There's nothing that I cherish more in my professional career than being part of teams that are truly interested in advancing how we do things.

At the Head & Neck Institute, we've embarked on an ambitious reset. I'm so impressed by the enthusiasm across the entire institute to dive into this process. Shortly after my arrival, we began a structured strategic planning process that initially focused on the creation of healthy teams — designing for optimal teamwork with the goals of innovation, impact and excellence. Every section has charted a bold new vision of the future for their subspecialty.

I believe there are four critical elements moving forward. First, we need a compelling and clear vision of precisely what we are seeking to become. Second, we must support a culture that aligns with that vision. Third, we are reorganizing our structure and core processes to align with our vision. Finally, we'll create a system of accountability and rewards that continues to propel us in that direction.

These efforts will only be sustainable to the degree that the vision we create aligns with our own personal values. This touches on the reason we all entered medicine in the first place, as well as our personal decisions to join Cleveland Clinic. Our team has been having meaningful conversations about where we want to be in the next five to 10 years. From there, we can reverse-engineer the steps that will be necessary to get us to that point. These discussions are ongoing, and I look forward to sharing our updates throughout the year.

This issue of our newly renamed *Head & Neck Institute Innovations* reflects our incredible accomplishments as well as these aspirations. Inside, we discuss innovative surgical techniques, including ventilation techniques during microlaryngeal surgery, minimal access approaches in reconstruction surgery and a new standard in osseointegrated implant surgery. Our research illustrates how we can improve care for aspirin-exacerbated respiratory disease patients, head and neck cancer patients and tracheostomy patients, and how dentists can help patients with ear pain. We focus on how we're helping the next generation of head and neck physicians through our residency and fellowship programs, and we're reiterating the importance of patient advocacy when it comes to cochlear implant access.

I hope you enjoy this issue and that you can get a sense of our team's passion and excitement. We're proud of our accomplishments and the people behind them. We are also very excited to accelerate our pace of innovation as we move into 2021 and beyond, carrying on Cleveland Clinic's tradition of providing and improving world-class care.



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PATIENTS WITH ENIGMATIC EAR PAIN MAY BE HELPED BY A DENTAL REFERRAL

An answer may be found by looking at the teeth

By Karyn A. Kahn, DDS

Cleveland Clinic otolaryngologists and audiologists have often recognized the importance of dentistry in the management and diagnosis of otalgia and other ear symptoms such as subjective tinnitus and ear stuffiness. In a recent chart review of 73 temporomandibular disorder (TMD), patients seen within a two-month period at the Head & Neck Institute's Section of Dentistry and Oral Surgery, 41% had complaints of otalgia, ear stuffiness and/or tinnitus. Of these 30 patients, 15 patients were referred and cleared for ear pathology by Cleveland Clinic ear, nose and throat specialists prior to referral for a comprehensive TMD consultation.

Chart review showed that 90% of the total number of TMD patients acknowledged diurnal or nocturnal bruxism and/or had clinical evidence of tooth attrition from clenching or grinding of their teeth. It has been reported that parafunctional habits are centrally mediated and have a tendency to run in families. Parafunctional habits are also affected by stress, anxiety, depression, alcohol, smoking and some anti-anxiety medications, such as selective serotonin reuptake inhibitors. As noted during the chart review, 36 of the 73 (49%) TMD patients were currently taking medication for anxiety or depression or receiving other psychotropic medications.

Parafunctional habits — such as grinding and clenching of teeth, cheek chewing, gum chewing, ice chewing and nail biting — require masticatory and cervical muscle function that can result in myositis or propagation and activation of myofascial trigger points in the jaw and neck muscles.

The masticatory and cervical muscles most often involved during these behaviors include the sternocleidomastoid (SCM), masseter and lateral pterygoid muscles. Masseter muscle trigger points can refer to the ear, eyebrow, molar teeth and lower mandible. Unilateral tinnitus has been shown to be associated with trigger points from the deep masseter and lateral pterygoid with modulation of tinnitus in some patients with the clenching of their teeth.

SCM trigger points are associated with poor head/neck posture and can refer pain to the frontal, cheek, eyebrow, vertex, ear and throat regions. In addition, SCM trigger points can result in proprioceptive disturbances such as dizziness and autonomic phenomena, including symptoms involving the eyes and sinuses. The lateral pterygoid muscle trigger points refer to the preauricular area and can be misdiagnosed as intracapsular temporomandibular joint (TMJ) arthralgia. Ear stuffiness symptoms related to medial pterygoid hyperactivity can explain the presence of ear blockage in patients when otitis media and otitis externa have been ruled out by an ear, nose and throat specialist.



25-year-old female with bilateral ear pressure/fullness. Note the wear on maxillary anterior teeth due to lateral grinding.

The medical profession can provide a great service to the patient with chronic episodic ear pain during a clinical exam by looking for occlusal wear on teeth during the intraoral exam, evaluating medications that may indicate a presence of comorbidities of stress/anxiety, and providing a cursory muscle palpation

exam of the neck and jaw muscles. Trigger point jump signs to taut bands within a muscle could indicate the source of dysfunction and a possible referral pain source. Auscultation and palpation of the TMJs may indicate a possible overload to the masticatory system, and this finding should warrant subsequent referral to dentistry.

Providing information that aids patients in their recognition and discontinuation of parafunctional habits can be life changing for some patients. Education on proper head and neck posture, awareness programs directed to reducing daytime clenching and other habits, and the understanding of myofascial trigger point referral can provide self-awareness initiatives to our patients.

The contribution from parafunctional habits and myofascial pain is an important consideration in diagnosing enigmatic ear pain, dizziness, tinnitus and other seemingly unrelated symptoms. Dentistry could prove to be a very effective partner in the management of these patients.



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GIVING COCHLEAR IMPLANT CANDIDATES A VOICE FOR HEARING

Cleveland Clinic's Hearing Implant Program advocates to improve CI access



Sarah A. Sydlowski,
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Only about 10% of patients who could benefit from cochlear implants (CIs) actually have the devices. One reason for this underutilization is that insurance coverage has not expanded as rapidly as clinical best practices. While CI is commonly a covered benefit for severe-to-profound hearing loss, insurance policies often limit access for patients with single-sided or asymmetric hearing loss, or significant residual hearing in the ear to be implanted. Sarah A. Sydlowski, AuD, PhD, MBA, Audiology Director, and Erika Woodson, MD, Medical Director of the Hearing Implant Program in Cleveland Clinic's Head & Neck Institute, believe that in order to improve future access to the device, clinicians have a responsibility to recommend the most appropriate clinical option, inform patients of their candidacy and potential for benefit, and quantify for insurers the impact that lack of coverage has on their beneficiaries.



Erika Woodson,
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Determination of CI candidacy has changed tremendously in recent years. Modifications to the standard test batteries have been implemented, such as using single words rather than sentences, and providers realize that ear-specific consideration is critical. The presence of residual hearing is no longer a contraindication; rather, it often results in more favorable outcomes. "Our technology and our ability to help people hear is continuing to grow, but the coverage for those services, especially for people who have less than profound hearing loss, isn't keeping track," explains Dr. Woodson.

Determining CI candidacy

For most situations, the U.S. Food and Drug Administration (FDA) criteria for CI still generally describe candidacy by speech recognition ability using sentences, as well as both ears' contribution to listening ability. Because there is flexibility to go off-label, this approach is not a completely limiting factor, but some insurance policies expect the clinician to follow FDA criteria rigidly in order to cover the procedure. Even more stringent, the Centers for Medicare & Medicaid Services (CMS) requires that Medicare Part B beneficiaries demonstrate limited benefit with hearing aids when both ears are listening together. CMS also still requires sentence recognition to determine candidacy, with

a much more stringent cutoff than the FDA's. Although the slow-to-advance coverage of CI is disappointing to clinicians who know the benefit that can be enjoyed by recipients, the trend of clinicians indicating that patients are not CI candidates because they don't meet their insurer's coverage criteria is even more concerning.

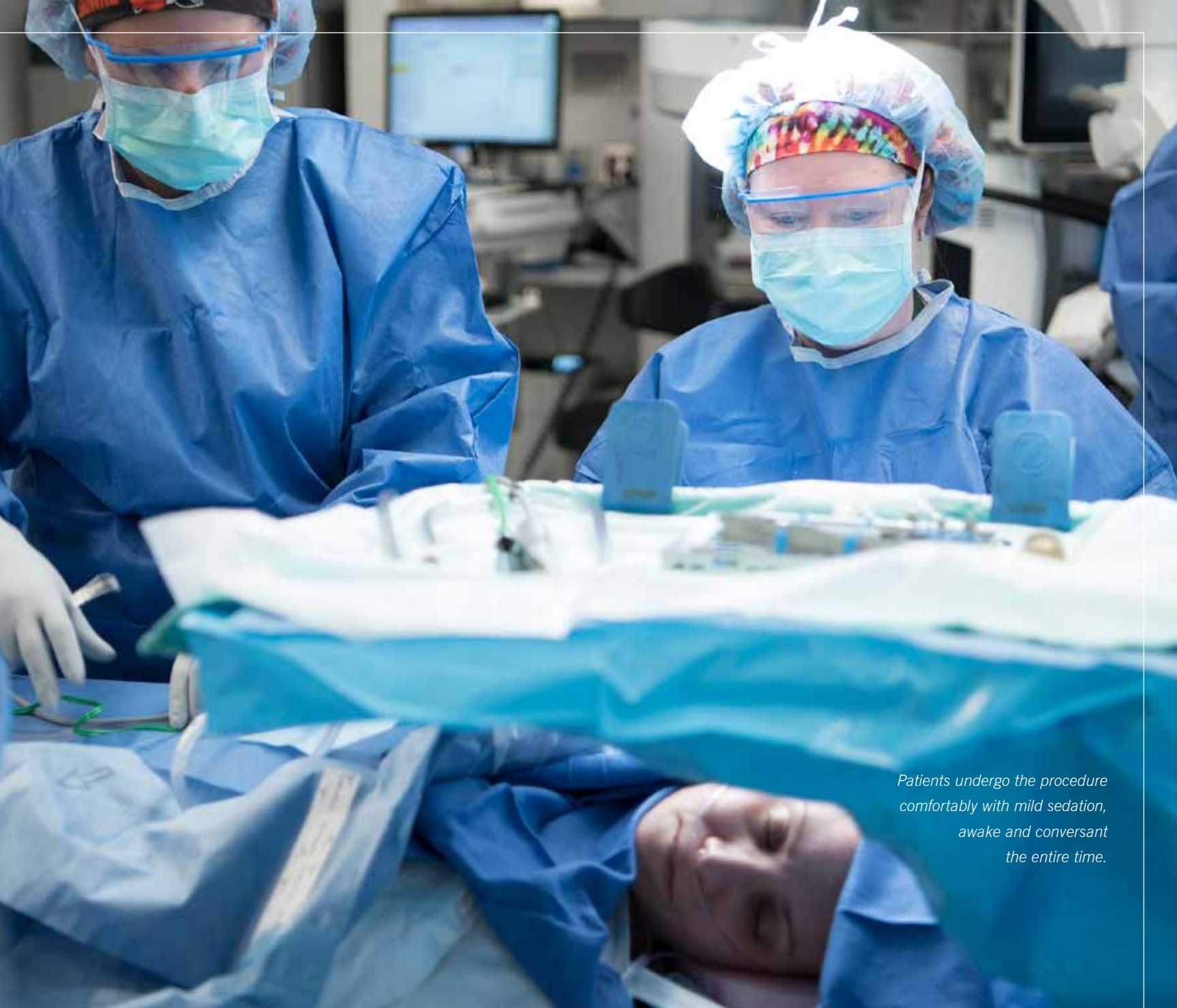
Drs. Sydlowski and Woodson believe this misleading documentation obscures the impact that overly restrictive regulations are having on patient outcomes. They believe that it's important to define the two factors that determine whether a patient can proceed with CI: clinical candidacy and insurance coverage.

"If we tell a patient 'You're not a cochlear implant candidate' when the reason is solely that they don't meet their insurer's coverage requirements, they come away feeling frustrated and don't understand why they aren't doing better with their hearing aids," says Dr. Woodson. "That explanation is very different than saying, 'You are a cochlear implant candidate. We think you'd get benefit. We know you're struggling. Your insurance just won't pay for it.' That's a much different message for the patients."

Facilitating change through education and transparency

Improving patient understanding of the issues surrounding CI candidacy could be a major catalyst for improving access. "If patients better understand the benefits of the technology, and if they get frustrated as a group that they are not given access to these benefits, they may have the opportunity to influence regulators and payers," Dr. Sydlowski says. "If patients better understand those differences, and it changes what insurance company they decide to go with, that can be really impactful."

The Hearing Implant Program team is also committed to using transparent language when describing their CI recommendations. Dr. Sydlowski explains, "We want to be candid with payers, our patients and our referring providers. If we are transparent, we can help people understand our process, our decision-making, and how we determine whether someone's a candidate or not. There's an educational piece, too. For referring providers, if we send



Patients undergo the procedure comfortably with mild sedation, awake and conversant the entire time.

back a note that simply says this patient is not a candidate based on payer, then they might not refer someone else with a different payer who looks very similar and actually would be a great candidate.”

The Hearing Implant Program team has been actively involved in finding ways to influence regulators and payers. They have participated in clinical trials that focus on expanding candidacy. They are closely monitoring which cases payers are rejecting and are working with those payers directly to reconsider their clinical policies. Team members are working on task forces to develop position statements that support delivering recommendations that align with best clinical practices, and the team has discussed how to best structure their notes and patient communication to support this kind of messaging.

“In our Hearing Implant Program, patients are going to learn more than ‘Yes, you’re a candidate,’ or ‘No, you’re not,’” says Dr. Sydlowski. “They’re going to hear the why. If someone isn’t a candidate, we’re going to offer nonsurgical options that will help them hear better. If they are a candidate but their insurance won’t cover it, we’re going to be very clear about that situation. If they are a good candidate, we’re using really progressive criteria to identify and document the potential for benefit, and we’re going to make sure that candidates have access to the technology as soon as humanly possible, so that they can receive the most benefit.”

RESEARCH VALIDATES QUALITY OF CARE METRICS IN OCSCC PATIENT CARE

The multi-institutional study found that adherence to four key metrics improves patient survival



Eric Lamarre, MD
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Head and Neck
Surgery and Oncology

New research indicates four process-related quality metrics are significantly associated with disease outcomes and mortality in oral cavity squamous cell carcinoma (OCSCC) patients. The findings from a multi-institutional cohort validate that adherence to all, or all but one, of the quality metrics is associated with improved survival. The study was published in the journal *Head & Neck*.

Over the past several years, there has been a movement toward the development of quality of care measures for patients with OCSCC. Previously published data on oral cavity cancer from a single institution assessed a variety of process-related metrics and identified four quality metrics where compliance was associated with improved patient survival. These metrics, known as a “clinical care signature,” include neck dissection with lymph node yield of 18 or more, no unplanned surgery within 14 days, no unplanned readmission within 30 days, and referral for adjuvant radiotherapy for stage III or IV disease. The objective for the present study was to evaluate, in a multi-institutional cohort, whether adherence to these four key metrics was associated with improved survival in patients with clinically treated OCSCC.

Methods

A multi-institutional retrospective review was performed of patients 18 years and older who were treated with primary surgical resection for OCSCC at three tertiary care centers between Jan. 1, 2005, and Jan. 31, 2015. The primary outcome assessed was the rate of adherence to the four quality metrics, and secondary outcomes assessed were measures of survival (overall, disease-specific and disease-free).

“While these are all process-related metrics, I think that two of them really speak to the quality of immediate care,” says Eric Lamarre, MD, an otolaryngologist with Cleveland

Clinic’s Head & Neck Institute and the lead author of the study. “The lymph node yield of 18 or more has been shown to speak to the extent of neck dissection performed. Referral to adjuvant treatment for stage III or stage IV is a very well-accepted guideline — it speaks to the quality of the multidisciplinary care in the management of these patients.”

The study included 773 patients from three institutions. The patient cohort included 474 males (61.32%), and 539 patients (69.72%) were tobacco users. Tongue cancers were the most common. Methods of surgical resection

included wide local excision (20.83%), partial glossectomy (38.03%), total glossectomy (0.65%) or other composite resection (40.36%).

Findings and next steps

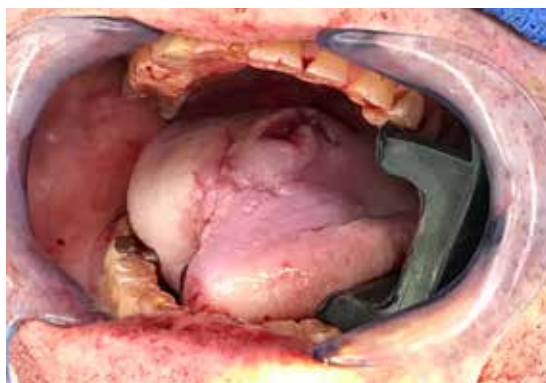
“One of the things that surprised me was the strong compliance with the four metrics,” says Dr. Lamarre. “Even with the strong compliance, we were able to determine that failure to

comply with the metrics was significant enough to make our conclusions.”

The data showed that 507 patients (65.6%) met all four quality metrics of interest. There were 240 patients (31.1%) who had adherence to three of the four quality metrics, and 26 patients (3.4%) had two or more missing metrics. However, compliance with the individual quality metrics included overall was high — 736 patients (95.21%) did not have an unplanned reoperation within 14 days and 731 patients (94.57%) did not require readmission within 30 days. In addition, 595 patients (76.97%) from the total cohort had a neck dissection with lymph node yield of 18 or greater, and of the 494 patients with stage III or IV disease, 455 (92.1%) received a referral for radiation therapy.

“Interestingly, neck dissection with lymph node yield of 18 or greater was, by itself, not significantly associated,”

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Invasive tongue cancer involving the dorsal portion of the tongue.

HOW CLEVELAND CLINIC IS REEVALUATING AND IMPROVING TRACHEOSTOMY CARE

Using a care pathway approach, the Head & Neck Institute has improved care and reduced costs.

In order to improve care and reduce organizational costs, the Head & Neck Institute at Cleveland Clinic implemented a care pathway approach for tracheostomy. Brandon Hopkins, MD, Quality Director for the Head & Neck Institute and Surgical Director, Pediatric Center for Airway, Voice and Swallowing, described the efforts involved with this process in a presentation at the American Academy of Otolaryngology – Head and Neck Surgery Annual Meeting 2020.

Following a devastating tracheostomy complication in 2017, physicians at the institute did some serious introspection to determine how to improve processes and deliberate care for tracheostomies. Performing over 650 tracheostomies per year, Dr. Hopkins and his team realized that high-severity complications had been identified, but many complications were not apparent because they had never been registered as safety events. This led to a combination of clear knowledge gaps in care and no standardized care.

“Our rationale for this care pathway was to consider our organizational costs,” says Dr. Hopkins. “I think that’s how we analyze a lot of things in a big system. We measure those costs by considering harm to patients, readmissions, readmitting to higher levels of care, length of stay and decannulation rates, and potentially

compensation, Medicare, Medicaid, and reimbursements related to quality.”

Four groups created to spearhead change

In order to spearhead change at a local level, Dr. Hopkins formed four separate work groups. They identified the key stakeholders across the department. “Identifying and getting buy-in from these stakeholders was our primary effort toward changing the culture. Everybody was in their own silos, and we approached breaking down those barriers to try put them all within these working groups.”

The groups included caregivers focused on order sets, post-op care, emergency planning and rounding. The groups met in person two to three times over four months. Each group developed a unified plan and an agreed-upon strategy of how to move forward.

“The post-op care work group identified a unified workflow for tracheostomy care, highlighting where joint responsibility and individual responsibility reside for suture management, suctioning, tracheostomy changes, speaking valves and tracheostomy teaching,” says Dr. Hopkins.

The order set working group focused on developing one order set that would be used consistently. “We wanted one order panel for anybody who came to Cleveland

Clinic, whether it’s a new tracheostomy, an established tracheostomy, an adult tracheostomy or a pediatric tracheostomy. We wanted the caregiver to be able to easily find anything they needed to know for tracheostomy care,” says Dr. Hopkins.

The emergency working group developed many strategies centered around patient safety.



Brandon Hopkins, MD
Quality Director, Head & Neck Institute;
Surgical Director, Pediatric Center for Airway, Voice and Swallowing



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COVID-19 CATALYZES HEAD & NECK INSTITUTE'S USE OF TELEMEDICINE

When the pandemic hit, the institute was able to stay agile and adapt, thanks to existing infrastructure



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During the early days of the COVID-19 pandemic, the Head & Neck Institute at Cleveland Clinic suddenly and successfully used telemedicine to care for patients. Prior to the pandemic, just 0.3% of all visits to the institute were virtual, and were additionally scattered among a small number of providers. However, virtual visits skyrocketed to 70% of all visits when the pandemic hit, with all providers suddenly providing care to patients remotely.

“Before COVID-19, I would have about eight slots a month, and I was our highest-volume virtual visit provider,” says Dr. Erika Woodson, Section Head of Otolology, Neurotology and Lateral Skull Base Disorders, and Telehealth Advocate for the Head & Neck Institute. “Virtual visits were used on an as-needed basis, rather than as the modus operandi. But when COVID-19 lockdowns happened, suddenly everyone had to transition.”

Removing barriers to virtual care

Before COVID-19, Cleveland Clinic had already set an institutional goal to grow telemedicine. This meant there was infrastructure already in place to help the organization pivot once lockdowns occurred. Meetings occurred almost daily, and emails were sent out almost continuously, to train and prepare the clinicians for this new reality. “It was a massive effort,” said Dr. Woodson, acknowledging the determination everyone brought to the cause. “We thought we had five years to work toward our goals. Instead, we had five days!”

Several factors had contributed to the limited growth of telemedicine across the U.S., but government action prompted by the pandemic removed some of the most obtrusive barriers. The emergency declarations paved the way for parity in insurance coverage for virtual and in-person visits for patients with Medicare, Medicaid and commercial payers. Additionally, HIPAA restrictions on virtual platforms were suspended, allowing providers to counsel patients through Facebook, Google Duo, Zoom or other programs the patients could manage. This gave the team the flexibility to support the increased number of visits and eliminated the need to train physicians who were unfamiliar with Cleveland Clinic’s preexisting telemedicine platform.

Cleveland Clinic addressed another major barrier by removing copays for all telemedicine visits in the early days of the COVID-19 outbreak. Prior to the pandemic, virtual visits operated under a fee-for-service model, because insurers would not routinely offer payment for these services, Dr. Woodson explained. “This change allowed the department to reach patients that we weren’t reaching before — patients who weren’t able to afford or didn’t see the value of telemedicine with our preexisting fee-for-service model.” With no copay, and hesitation to come into the office during lockdown, patients were much more open to trying telemedicine.

Current challenges

Although the removal of these barriers improved access to telemedicine, there are still limits to what the Head & Neck Institute can treat virtually. “The general nature of otolaryngology is that there’s not a lot that you can examine through a screen,” says Dr. Woodson. “You can’t look in a nose, you can’t look in an ear and you can’t look deep into the throat. That’s everything we do. For us, the emphasis with virtual visits turns into a lot more history-taking and data review such as imaging, more so than the physical exam.”

Cleveland Clinic decided to resume elective surgeries and outpatient clinics in May 2020, and the Head & Neck Institute moved quickly back to an in-person model of care. Many patients had been triaged, with staff knowing that they would need in-person care when it was safe to provide it. To accommodate the pent-up demand for in-person care, virtual visits dramatically decreased when clinics reopened. Virtual visits represent approximately 5% of outpatient visits at the time this article was written.

Dr. Woodson says, “One of the things that everybody’s worried about with the shutdown is the consequences of delayed care — people who didn’t receive the preventive care or procedures they needed. We are going to see patients come in with more advanced disease because of that delay in seeking care.”



Dr. Woodson notes there are certain benefits to providing care virtually. Some may argue that virtual visits seem more impersonal because the patient and caregiver are not in the same room, but she believes this might not necessarily be true. “When I’m in the patient’s room, they have a mask on, and I have a mask and face shield,” says Dr. Woodson. “To me, that feels a lot less personal than a virtual conversation where I can see a patient’s face and their expressions, and they can see mine.”

Another point she brings up is the restrictions on visitors for in-person visits due to COVID-19. While Cleveland Clinic currently limits in-person visits to just the patient and their physician, virtual visits do not have the same restrictions. Having a family member at the appointment can help ensure the patient is understanding everything, which increases compliance and patient satisfaction. For complex care and decision-making, a virtual appointment may be the best option.

Future plans

While there are obvious limitations to telemedicine for head and neck physicians, Dr. Woodson says the department still has plans to expand its use. One area in which she would like to see telemedicine used is improving care to rural patients, the elderly and the socioeconomically disadvantaged — all populations with different technology gaps which limit their access to these services.

Dr. Woodson explains, “I’ve challenged each of our subspecialty sections to determine what patient populations we can treat virtually, or at least provide second opinions for virtually. Telemedicine can allow patients to receive care from Cleveland Clinic physicians, even if they are far away. If we don’t have the ability to see them physically in person, there’s still a lot we can do to advise them or advise their local provider about taking care of their problem. The demand for virtual care is not going to go away, and I’m excited to see how our use of it matures.”

RESEARCH VALIDATES QUALITY OF CARE METRICS IN OCSCC PATIENT CARE

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says Dr. Lamarre. “There’ve been some studies to suggest that it may be, so that was a bit of a surprising finding. Unplanned readmission was significantly associated with worse overall survival. Unplanned readmission may be the result of preexisting comorbidities, surgical site complications or difficulties with transitions of care. The only metric that demonstrated the improved disease-specific survival was referral to radiation oncology for late-stage oral cavity cancer.”

Looking ahead, Dr. Lamarre notes that the next steps for this research might be to find other similar disease processes within the head and neck to see if there are any process-related metrics that impact survival. He also believes that otolaryngologists need to examine how to improve adherence to these metrics through quality improvement programs.

“I think what this study does is validate these metrics in a multi-institutional cohort,” says Dr. Lamarre. “These four metrics are integral to the care of the oral cavity cancer patient, really speak to the quality of care of the disease process and significantly impact overall survival.”

Head & Neck Institute Innovations | WINTER 2020/2021

Head & Neck Institute Innovations offers information from Cleveland Clinic otolaryngologists, speech pathologists, audiologists and dentists about new and emerging medical, surgical and rehabilitative techniques. It is written for physicians and should be relied on for medical education purposes only. It does not provide a complete overview of topics covered and should not replace the independent judgment of a physician about the appropriateness or risks of a procedure for a given patient.

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THRIVE IS A SAFE VENTILATION TECHNIQUE DURING MICROLARYNGEAL SURGERY

The technique comes without many of the drawbacks associated with other ventilation methods



Paul C. Bryson, MD Director, Cleveland Clinic Voice Center; Section Head Laryngology

New findings suggest that transnasal humidified rapid-insufflation ventilatory exchange (THRIVE) could be an effective and safe oxygenation and ventilation technique during microlaryngeal surgery. This technique addresses many of the disadvantages associated with other methods. The study was published in *The Laryngoscope*.

“These findings further establish this as a reasonable ventilation and anesthesia strategy for patients undergoing microlaryngoscopic surgery,” says Paul C. Bryson, MD, Director of the Cleveland Clinic Voice Center, Section Head of Laryngology, and one of the study’s authors. “It’s not a replacement for being prepared with traditional techniques, but it is another strategy that seems to be pretty low risk for patients. For surgeons who are practicing in locations with anesthesia colleagues who may not be comfortable with jet ventilation, or for situations where you want to have a little more working time than just the intermittent apnea technique, this seems like a nice option because it’s certainly not a high-technology set up.”

Disadvantages associated with other methods

Typically, microlaryngeal surgery requires oxygenation and ventilation via an endotracheal tube (ETT), jet ventilation (JV) or intermittent apnea with an ETT. However, these methods come with significant disadvantages. The ETT often obscures the posterior glottis, JV can cause movement in the structures of the larynx and intermittent apnea leads to frequent interruptions. THRIVE incorporates a device that delivers continuous, warmed and humidified oxygen of varying FiO_2 and a high flow rate up to 70 L/min through a nasal cannula.

The procedure

The present study included patients who underwent microlaryngeal surgery with the THRIVE technique between December 2018 and January 2020. Patients were identified through electronic medical record review.

Patients were premedicated with intravenous (IV) midazolam. Once the patient was apneic, mask ventilation was instituted for approximately two minutes until the



The THRIVE system can be seen here coming around the right side of the patient and resting in the nostrils, similar to a nasal cannula. The system does not typically interfere with the surgeon’s ability to image and instrument the larynx.

muscle relaxant took effect. The mask was then removed and replaced with the high-flow cannula, and suspension laryngoscopy was performed. THRIVE was maintained at 70 L/min at 100% FIO₂. Once the procedure was finished and the laryngoscope was removed, an oral airway was applied to keep the airway open while THRIVE was continued.

Careful consideration of patients

Patient selection must be thoroughly considered in order to achieve optimal outcomes. In obese patients or those with residual deep neuromuscular blockade, a supraglottic airway was inserted upon removal of the suspension laryngoscope for ventilation during emergence from anesthesia at the anesthesiologist's discretion. When possible, greater success is expected with patients with a body mass index (BMI) <30.

"One of the things, with some patients who are obese or have obstructive sleep apnea, is that you can have some tissue collapse in there, and they're harder to ventilate in this fashion, just because the pathway for the oxygen isn't necessarily open," says Dr. Bryson. "In those patients, you need to be prepared and have all your regular equipment available. You may have less time to do your work, or it just simply won't be adequate for ventilation."

Findings and next steps

A total of 53 patients had THRIVE as the sole method of ventilation during the included time period. The majority of patients were female (median age was 51 years; median BMI was 25 kg/m²). Most patients were American Society of Anesthesiologists (ASA) class 2, and most patients had a Mallampati score of 2. Among these patients, the more common surgical indications were subglottic stenosis, vocal fold lesions and vocal fold paralysis. Median apnea time was 16 minutes. Median end tidal CO₂ was 50 mm HG and median minimum SpO₂ was 95. Of the 53 cases, six cases required supplementation of THRIVE with JV or tracheal intubation for sustained oxygen desaturation. There was a statistically significant positive correlation between end tidal CO₂ at the end of the case and apneic time ($P < .02$). There was a 0.844 mm Hg increase in end tidal CO₂ for every minute of apneic time ($r^2 = 0.25$).

Looking ahead, Dr. Bryson notes that while this study focused on adults, it would be interesting to see if THRIVE technology could work in children undergoing airway procedures as well as in other settings, particularly in the context of COVID-19. "We're currently in a pandemic with a respiratory virus. It's unknown to me what, if any, role this plays for those patients who have evolving airway compromise or hypoxemia or need to go to the ICU, but understanding how this technology might improve care for those patients is certainly something worth exploring," says Dr. Bryson.

HOW CLEVELAND CLINIC IS REEVALUATING AND IMPROVING TRACHEOSTOMY CARE *continued from p. 5*

One strategy included signage that automatically prints from a nursing order once the patient gets to the floor. The signage includes diagrams of the airway, the type of airway and how to intubate the patient. "The goal is that nothing will be written or drawn on a piece of paper," explains Dr. Hopkins. "It will all be automatically drawn into their chart and put into their bedside signage."

Along with an interventional pulmonologist, cardiothoracic surgeon and resident laryngologist, Dr. Hopkins formed a tracheostomy rounding group. This team helps finalize and organize all the disparate operating procedures to streamline care. It's also provided education to both patients and providers on the floor and is constantly refining portions of the order set.

The costs and benefits of instituting this program

Dr. Hopkins notes that, while the changes have been successful, one of the biggest initial challenges was making the argument that these changes are necessary and cost-beneficial to the institution. All of the providers are in different institutes that paid for different downstream effects, explains Dr. Hopkins.

To make this argument, Dr. Hopkins and his team identified three different supporting points: the direct costs of a rounding team, the funding offsets and the indirect cost, and the benefits to a healthcare system. Dr. Hopkins argues that while there are direct costs for operating a rounding team, there are several funding offsets. These include the tracheostomy consults and the rounding notes, which can be billed; operative billing; tracheostomy changes; flexible tracheoscopy; speech consults for speaking valves and swallowing; direct consults to ear, nose and throat specialists, thoracic and IP, and follow-up clinic billing.

While not as easily measured, there are also a number of indirect costs. "I think tracheostomy is very relevant for the *U.S. News and World Report* rankings in terms of mortality and survival score by hospital, along with length of stay and readmissions," says Dr. Hopkins.

CHANGING THE FACE OF MICROVASCULAR RECONSTRUCTION

Anterolateral thigh fascia flaps, minimal access approaches and abbreviated hospital stays are reducing the “costs” of free flap surgery

By Michael Fritz, MD



Michael Fritz, MD
Section Head,
Facial Plastics and
Reconstruction

A new low morbidity free flap

Free tissue transfer is among the most complex procedures performed in head and neck surgery, and it is typically associated with high morbidity treatment and protracted hospital stays. Advances in flap harvest and design, vessel isolation, and postoperative patient management — all initiated here in Cleveland Clinic's Head & Neck Institute — have dramatically changed this landscape.¹⁻³ By combining the minimal morbidity of anterolateral thigh (ALT) perforator flap harvest technique with minimal access approaches for vessel procurement, a low morbidity free flap subset has been created. Patients undergoing these surgeries are commonly discharged within 72 hours and as early as the first postoperative day after surgery. This policy does not compromise flap success or increase postoperative complications or hospital readmissions.^{4,5} As a result, we have dramatically decreased the physical and financial “cost” of free flap surgery. Thus, indications for free tissue transfer have expanded both for primary defect reconstruction and for secondary procedures to improve quality of life, correct deformities or counter complications from previous oncologic treatment. Examples are discussed below.

Palatal fistula reconstruction

Defects in the palate may persist for a variety of reasons. These could be the result of unsuccessfully repaired congenital clefts, previous cancer or tumor removal, trauma, infection or ischemic events, e.g., cocaine use or granulomatosis with polyangiitis (GPA, formerly called Wegener's). When locoregional tissue is compromised, or when primary reconstructive attempts fail, patients with fistulas have typically been relegated to management with long-term obturators. While these devices often provide tremendous relief to the speech and swallowing compromises created by palatal insufficiency, they require chronic maintenance, are prone to leakage and require manual dexterity for placement. As an alternative, these defects can be repaired with near 100% reliability using free vascularized fascia lata and vessels obtained through a 3 cm incision under the mandible. Patients undergo a

three- to four-hour operation and are typically discharged within two days after surgery.⁶

Rescue flaps to halt osteoradionecrosis

Osteoradionecrosis of the mandible, maxilla, skull base or cranium poses a frequent challenge for reconstructive surgeons. Typical management following bone debridement has included hyperbaric oxygen (HBO) therapy, despite controversy about the effectiveness of this costly and time-consuming treatment. However, if this initial course of action fails, there have been few options to stop disease progression. Using heavily vascularized fascia lata free flaps layered into oral bone defects, obliterating and covering areas of cranial exposure and draped onto debrided skull base bone, progression of bone destruction can be permanently halted. This method carries the advantage of a relatively short procedure with low morbidity, minimal edema, no risk of airway compromise and a 95% success rate in appropriate candidates. In a comparison study, the combined cost of rescue flap surgery and hospitalization was less than one-third the cost of HBO therapy. More importantly, this method does not compromise the ability to perform larger-scale reconstruction, such as segmental mandibular repair, if necessary.⁷

Effective reconstruction of smaller, complex facial defects or longstanding deformities

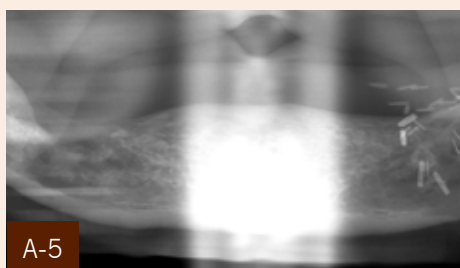
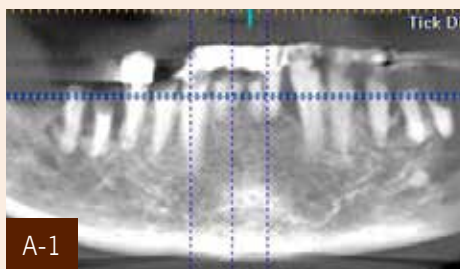
Low morbidity fascia lata flaps can be applied to repair complex facial wounds following cancer resection. For example, one of the more challenging subsets of nasal reconstruction is large columellar and caudal septal defects. In the past, free tissue transfer was an infrequent consideration because of bulk, complexity and high morbidity. However, given the malleability and reliability of vascularized fascia lata, this flap can be applied to support new structural grafts and provide a foundation for skin grafts — using this method, rapid restoration of facial form and function can be achieved.⁸ Furthermore, when applied beneath the skin, these free flaps impart lasting and reliable correction of facial contour deformities, even in a previously irradiated or scarred milieu.⁹

A new opportunity to improve lives

By using low morbidity free flaps and vessel isolation techniques, the overall “cost” of free tissue transfer has decreased dramatically. This opens the opportunity for innovation to improve short- and long-term functional and aesthetic outcomes for our patients. Our ability to permanently transfer vascularity to compromised tissue with rapidity and high reliability suggests that early surgical intervention for osteoradionecrosis has merit to arrest this process and avoid long-term sequelae.

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- A-1** Rescue pan pre-Panorex with significant bilateral ORN with multiple devitalized teeth requiring extraction;
- A-2** Rescue defect – appearance of mandible after tooth extraction and debridement;
- A-3** Rescue inset – vascularized rescue flap in place;
- A-4** Rescue post – postoperative appearance at one year;
- A-5** Rescue pan post-Panorex at 1 year post-op with smooth mandibular borders and no residual ORN

- B-1** Post Mohs defect of columella, infratip lobule, soft triangle, nasal floor and caudal septum;
- B-2** Inset of ALT fascia flap wrapped on new cartilage construct with overlying skin graft. Flap vascularized via angular artery and vein isolated via minimal access incision;
- B-3,4,5** Outcome at four months post-op.

IMPROVING PATIENTS' HEARING IN 10 MINUTES

A minimalist approach to osseointegrated implants emphasizes an easy patient experience



Erika Woodson, MD, FACS
SSection Head,
Otolology, Neurotology
and Lateral Skull Base
Disorders; Medical
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Implant Program

For patients with conductive or mixed hearing loss, auditory osseointegrated implant surgery can be life changing. However, traditional implant surgery has been intimidating to patients. To overcome these barriers to patient acceptance, the Cleveland Clinic Hearing Implant Program's (HIP) team of neurotologists and audiologists offer patients osseointegrated implants with a very streamlined surgery and recovery process. Their approach drastically decreases surgical time, with almost no down-time for the patient after surgery.

Osseointegrated implants works by rerouting sound, which is distinctly different from a cochlear implant. While a cochlear implant helps restore hearing in an ear with sensorineural hearing loss, an osseointegrated implant is used to reroute sound to a functional cochlea. It is FDA-approved for patients who have conductive or mixed hearing loss, or single-sided deafness (SSD) when the other ear hears normally.

Many individuals have conductive or mixed hearing loss related to prior ear surgery or infections. These patients make up the bulk of the HIP team's osseointegrated implant recipients. "A classic example is a patient who's had a modified radical mastoidectomy," says Erika Woodson, MD, Section Head, Otolology, Neurotology and Lateral Skull Base Disorders and Medical Director of HIP. "They are likely missing ossicles, and do not have direct surgical options to restore hearing." Additionally, their mastoid cavity is not a healthy hearing aid environment. "These ears may start to have chronic drainage or infection when they try to wear hearing aids directly in the ear," remarks Dr. Woodson.

Another potential candidate is the patient with SSD. "If somebody has complete deafness in one ear and a normal ear on the other side, they can receive an osseointegrated implant on the deaf side that takes sound over to the good ear," explains Anh Nguyen-Huynh, MD, staff neurotologist. "This requires that the inner ear works normally on the side receiving the sound. In this situation, we place the implant on the bad side. But, instead of trying to send sound into the bad ear, it sends sound around to the other side through bone conduction."

Dr. Woodson notes that although HIP surgeons and audiologists now routinely recommend cochlear implantation as patient's best option, several patients may

not have that option. Insurance coverage for CI for SSD is still evolving, and patients' plans may not yet extend coverage for the device (see page 2 for more about CI candidacy and advocacy). Additionally, some patients may not be a candidate for CI, for example patients who lack an auditory nerve after vestibular schwannoma surgery, or pre-lingual congenital deafness beyond early childhood.

Maximizing a minimalist approach

While osseointegrated implant technology has been around since the 1970s, the surgical methods have improved significantly. "The initial surgical technique involved extensive soft tissue removal, and creation of a partial thickness skin graft to cover the area around the implant, which created a large wound to heal and an area of permanent hair loss," explains Dr. Thomas Haberkamp, MD, staff neurotologist. This method was also performed under general anesthesia. Ten years ago, a popular method adapted a linear incision with more modest soft tissue reduction; this technique could be employed under general anesthesia or moderate sedation, but still required extensive healing time with the risk of alopecia around the abutment.

The surgical technique employed at Cleveland Clinic is the MIPS (Minimally Invasive Ponto Surgery) technique. Although multiple surgeons nationwide use this technique, Cleveland Clinic takes the "minimal" part even further.

"I think that's one thing that really makes our program unique. We can offer the patient a very easy experience," says Dr. Woodson. "Sure, we sometimes still use general anesthesia, but we can do the MIPS procedure on most adult patients under just light sedation. They don't need full anesthesia; they don't even need twilight anesthesia."

Dr. Haberkamp explains that the scalp is numbed with an injection, and then a mild anxiolytic is administered while the surgery is performed. The whole procedure takes less than 10 minutes. The patient goes home with a dressing on their head; after removal the next day, there are no stitches and no visible wound to take care of, as a healing cap keeps the area hidden and clean. While they need to keep the area dry for the first week, they are able to continue their regular activities and they routinely return to work the next day. Most patients do not need narcotic pain control after surgery, Dr. Nguyen-Huynh notes.

continued on p. 15



Thomas Haberkamp, MD
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Base Disorders

ASPIRIN DESENSITIZATION MAY IMPROVE PULMONARY OUTCOMES FOR AERD PATIENTS

Cross-specialty collaboration to develop standard of care is still needed

Aspirin desensitization appears to be effective in improving pulmonary outcomes for patients with aspirin-exacerbated respiratory disease (AERD), according to a recent study appearing in *Otolaryngology–Head and Neck*. The meta-analysis examined results from 13 studies that measured endoscopic polyp grading, changes in radiologic severity of chronic rhinosinusitis and sinus quality-of-life scores.

AERD patients have a higher risk for nasal polyps, chronic sinusitis, asthma and aspirin sensitivity. Patients with this condition are also 10 times more likely to need sinus surgery than patients without the condition. Since aspirin desensitization's initial discovery, several studies have found that aspirin desensitization can drastically improve quality of life and nasal polyp burden, and reduce the need for surgical intervention for this patient population.

"There are several protocols published, mostly by asthma and allergy specialists, and there is a low dose or high dose protocol," according to Mohamad Chaaban, MD, an otolaryngologist in Cleveland Clinic's Head & Neck Institute and one of the authors of the study. "In our study, we divided patients into two groups based on this protocol — those who take less than 650 mg of aspirin per day and those who take more than 650 mg."

Methods and results

A total of 6,055 articles were initially reviewed for eligibility, and 13 studies met the inclusion criteria. These 13 studies were published between 1984 and 2018 and consisted of five randomized controlled trials and eight cohort studies. The authors of the present study did not find any significant improvement in sinonasal quality of life or smell scores with aspirin desensitization. However, pooled analysis of the three studies that included medication/steroid use showed a statistically significant reduction in the use of medications (standardized mean difference [SMD] = -0.792 , $P < .001$). For FEV-1 (forced expiratory volume in one second),

there was a statistically significant improvement (SMD = 0.451 , $P = .031$) among the studies that included this outcome measure.

"I didn't expect positive results in the pulmonary perspective; I thought the positive effect would be limited to the improvement of sinonasal symptoms," says Dr. Chaaban. "The good thing is that it really helps many patients and doctors who treat this condition, like allergists, sinus doctors, ENTs, pulmonologists and some primary care doctors as well."

Inconsistencies should lead to collaboration

In the included studies, aspirin dosage was highly variable, ranging from 100 mg to 1,300 mg daily. Duration of follow-up was also highly variable, ranging from one month to 36 months. Dr. Chaaban believes these variances reinforce the importance of developing a set of standard protocols. "One of the main advantages of the study is that it opens up the need for physicians to find an ideal regimen or ideal protocol to treat those patients," he says. "It may also lead to improved collaboration between pulmonologists and ENTs, to develop an algorithm for treating these patients and a standard of care to follow."



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Skull Base Surgery

OTOLARYNGOLOGISTS INFLUENCE THE NEXT GENERATION OF SPECIALISTS

Physicians from the Head & Neck Institute teach, advise and conduct research with students from Cleveland Clinic Lerner College of Medicine



Will Tierney, MD
Chief Resident, Head & Neck Institute

When Will Tierney, MD, applied to medical schools in 2011 after earning a master's degree in applied human anatomy from Case Western Reserve University, he already had extensive research experience. Because of its commitment to training physician investigators, he ultimately decided to attend the five-year program at Cleveland Clinic Lerner College of Medicine (CCLCM) of Case Western Reserve University.

“What really captured and held my interest was clinical research and the ability to translate scientific concepts into patient care,” says Dr. Tierney, now chief resident in the Head & Neck Institute at Cleveland Clinic. “And that is the central goal of the Lerner College of Medicine — training physician scientists who bridge hard science with the clinical art of medicine.”

While in medical school, Dr. Tierney gravitated toward otolaryngology because of early encounters and collaborations with physicians from the Head & Neck Institute who serve as preceptors, professors and advisors at CCLCM. The relationship between the institute and the medical college is mutually beneficial.

“As we work in the Head & Neck Institute to be the No. 1 place for residents to have surgical training and for patients to receive surgical

care, the Lerner College of Medicine is a foundational part of that,” says Paul Bryson, MD, Director of the Cleveland Clinic Voice Center and Section Head of Laryngology. He also serves as Associate Professor of Surgery and Assistant Director of Career Advising for CCLCM.

Partnering on seminal research projects

Dr. Tierney began research projects alongside Cleveland Clinic otolaryngologists soon after arriving at CCLCM, when Tom Abelson, MD, a Cleveland Clinic otolaryngologist who

has since retired from clinical practice but continues to teach and conduct research, was the preceptor of his class in the Arts & Practice of Medicine. Dr. Abelson introduced the first-year medical student to surgeons in the Head & Neck Institute via email. Dr. Bryson was the first to respond.

“We got together and started writing research proposals when I was a first-year medical student and he was first-year staff,” recalls Dr. Tierney. “We have been working together ever since.” They have collaborated on diverse clinical research projects examining the intersections of neuroscience and laryngology and the safety of office-based procedures.

Dr. Bryson also served as the advisor for Dr. Tierney's thesis on hemodynamic fluctuation during laryngological procedures. The thesis project for CCLCM led to Dr. Tierney earning a second master's degree — this one in clinical research science — from Case Western Reserve University. In addition, the year-long project comparing the hemodynamic impact of office-based laryngeal procedures

to that of those performed in the operating room has led to changes in clinical practice.

“It has been very helpful in demonstrating safety for patients in the office setting and

supporting our growth in office-based procedures, even for older patients and some that have comorbidities,” says Dr. Bryson.

Creating empathetic caregivers

While research is important at CCLCM, so too is helping students become empathetic caregivers. Dr. Abelson has assisted with that endeavor. From the time the medical school began enrolling students in 2004, he has served as a preceptor for first- and second-year medical students

“ By spending two hours with eight students during their first two years of medical school, I feel like I get to help form them into better doctors and better people. ”

– Tom Abelson, MD



Paul C. Bryson, MD
Director, Cleveland Clinic Voice Center; Section Head, Laryngology



Tom Abelson, MD
Contract Staff, Cleveland Clinic Lerner College of Medicine

in the Arts & Practice of Medicine. The class, which extends through all five years of the CCLCM program, covers topics such as medical ethics, diversity and inclusion, population health and more.

“By spending two hours a week with eight students during their first two years of medical school, I feel like I get to help form them into better doctors and better people,” says Dr. Abelson. He can also share a lifetime of experiences as a general otolaryngologist.

“I get to show off what we do in head and neck, and, with timely and accurate information, they can decide if it’s a field they want to pursue,” he says. “Even if they don’t go into otolaryngology, it’s very important for students to understand what we do, what they should and shouldn’t refer, and how to handle some of the issues we deal with.”

Forging lifelong relationships

Perhaps the biggest intangible benefit of the relationship between students from CCLCM and physicians from the Head & Neck Institute is collegiality — both professionally and personally.

Dr. Tierney credits Dr. Bryson as a mentor and with influencing his decision to pursue a subspecialty in laryngeal surgery. When he completes his residency in 2021, Dr. Tierney will start a fellowship in laryngology at Vanderbilt University. But the two physicians also forged a friendship beyond the clinical arena. As a physician-in-training, Dr. Tierney pays it forward by working alongside CCLCM students and helping them with their theses.

“The Lerner College of Medicine is one of the most innovative programs in the country, and the relationship with Cleveland Clinic’s Head & Neck Institute gave me opportunities I don’t think would’ve been replicated anywhere else,” says Dr. Tierney. “The access to staff physicians and the ability to do meaningful, clinically relevant research are built into the program. If you want to jump in and make a difference as a medical student, it’s welcomed with open arms here.”

IMPROVING PATIENTS’ HEARING IN 10 MINUTES

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When patients are considering options for this kind of surgery, offering them something that’s minimally invasive can be a major advantage, according to Dr. Woodson. “The difference between needing a mild sedative and needing a full anesthesia really impacts patients’ decision-making,” she says. “For patients who’ve been through perhaps multiple surgeries for chronic ear disease, they are resistant to undergo what feels like another major surgery. When I explain that it’s as simple as having dental work done, they’re far more receptive to exploring this option.”

Postoperative patient care

In addition to minimizing a patient’s time commitment on the day of surgery, the HIP team also has taken care to streamline the patient’s postoperative experience as well. The surgeon team uses telemedicine to handle most patients’ post-op visits. “We instruct them on how to properly take off their dressing in a five-minute face-to-face virtual visit,” says Dr. Woodson. “Many patients come from a distance for this procedure, so it’s wonderful that we can take them through the dressing removal and take a look at the implant from their own home.”

Cleveland Clinic’s HIP team allows the implant one month to heal before activation, the point at which the implant can be used with the external hearing processor. “The implant itself is just a metal post,” explains Dr. Haberkamp. “And the bone has to heal to that metal post — that’s why it’s called osseointegration.” After osseointegration has occurred, the audiologist sees the patient in person to fit their external hearing processor to the implant. Most patients require very little ongoing follow-up with the audiologist after activation.

Manufacturers ensure their external processors are regularly updated with new technology, meaning the implant itself is never obsolete. “The implant itself has really changed very little since its original inception. The bulk of innovation occurs externally, by making these processors smaller, more energy efficient, with improved sound quality and more power,” says Dr. Nguyen-Huynh. These newer processors are back-compatible with the patient’s implant, meaning that they’ll always be updatable without more surgery.

Happy Patients

Patients with chronic ear disease and conductive/mixed hearing loss frequently fight with their hearing aids, going back and forth between infections/drainage and the periods of disuse these infections cause. For many of these recipients, an osseointegrated implant has made a tremendous difference to their aural toilet and frequency of infections. Additionally, the sound quality of these implants is typically night-and-day better than their old hearing aids, notes Dr. Haberkamp.

Dr. Woodson notes that her osseointegrated implant patients are generally some of her most content. “Almost universally, people love them,” Dr. Woodson enthuses. “So we sought to remove as much intimidation around getting the surgery as possible. It’s rewarding to give these patients an easy, yet life-changing, option for their hearing loss.”

STAFF AWARDS AND ACHIEVEMENTS

Michael Benninger, MD, was named President-Elect of The Triological Society, President of the International Association of Phonosurgery and Vice-President of the Voice Foundation. He was also named Historian and member of the Executive Council of the American Laryngological Association, and Governor, Board of Governors, American College of Surgeons. He received the DeRoalds award for outstanding accomplishments in the field of laryngology from the American Laryngological Association.

Paul Bryson, MD, was named Chair of the Laryngology and Broncho-Esophagology Education Committee for the American Academy of Otolaryngology-Head and Neck Surgery (AAO-HNS). He was also named to the editorial board of the *American Journal of Otolaryngology*.

Mohamad Chaaban, MD, received the 2020 CORE Grant award by the American Rhinologic Society and the 2020 Cleveland Clinic Research Program Committee grant for his study, The Correlation of Cellular and Cytokine Profile with the Severity of Chronic Rhinosinusitis. He also received a two-year Simulation Research Fellowship on Simulation in Rhinology.

Dane Genter, MD, was appointed a diplomat of the American Board of Facial Plastic and Reconstructive Surgery. He was also awarded Fellow of the American College of Surgeons.

Donald Goldberg, PhD, was selected as a Fellow of the American Speech-Language-Hearing Association.

Julie Honaker, PhD, was selected to serve as an expert in her field for an Interprofessional Education Collaborative Scoping Review to evaluate the evidence of the success of interprofessional education and collaborative practice in improving the delivery of safe and effective healthcare. She has also published a book, "Diagnostic Vestibular Pocket Guide: Evaluation of Dizziness, Vertigo, Imbalance."

Brandon Hopkins, MD, is serving as the President of the Northeast Ohio Head and Neck Surgery Society.

Robert Lorenz, MD, MBA, has been named Executive Medical Director, Market and Network Services.

Tina Marks, AuD, was elected President-Elect for the Ohio Academy of Audiology.

Claudio F. Milstein, PhD received an Excellence Award for Distinguished Service from the American Academy of Otolaryngology – Head and Neck Surgery Foundation.

Tony Reisman, MD, received an Excellence Award for Distinguished Service from the American Academy of Otolaryngology – Head and Neck Surgery Foundation for his

work on the Rhinology and Paranasal Sinus Committee.

Joseph Scharpf, MD, was promoted to Professor of Otolaryngology-Head and Neck Surgery, Cleveland Clinic Lerner College of Medicine. He was also named Chair-Elect, Endocrine Surgery Committee, American Academy of Otolaryngology; Chair, Cranial Nerve Monitoring Task Force; and Chair, Video Education Otolaryngology, American College of Surgeons. He has been an Invited Professor and Keynote Speaker, Thyroid Management at Klinikum Bad Salzungen, Germany. He was an Invited Speaker at the 53rd Annual Iowa Head and Neck Cancer Course; at the 42nd George A. Sisson International Workshop at Vanderbilt University; and at the Surgery of the Thyroid and Parathyroid Course for Harvard Medical School's Department of Otolaryngology-Head and Neck Surgery.

Raj Sindwani, MD, began his term as President of the Medical Staff in January 2021 and serves on the Cleveland Clinic Board of Governors. He received a Committee Excellence Award from the AAO-HNS for his work on the Rhinology and Paranasal Sinus Committee. He recently published "Endoscopic Surgery of the Orbit" (Elsevier), and he was Section Editor for the textbook "Case Series in Otorhinolaryngology-Head & Neck Surgery and Audiology" (Anadem Publishing). He is also Editor-in-Chief of the *American Journal of Rhinology & Allergy* (Sage Publications).

Sarah A. Sydlowski, AuD, PhD, was appointed Associate Chief Improvement Officer for Cleveland Clinic. She was elected President of the American Academy of Audiology. She was also appointed Co-Chair of the American Cochlear Implant Alliance Program Committee and was appointed Subcommittee Chair for the American Academy of Audiology Program and Virtual Program Committees. She joined the editorial boards of *The Hearing Journal* and the *American Journal of Audiology*. She received the Executive MBA Leadership Award from Case Western Reserve University Weatherhead School of Management. She also received Healthcare Delivery and Implementation Science Center grant funding for a project titled "Reforming the Hearing Loss Care Delivery Model," which will support an initiative between Audiology, Geriatrics and Family Medicine designed to increase our collaborative approach to identification and management of hearing loss.

Troy Woodard, MD, was appointed a guest examiner for the American Board of Otolaryngology-Head and Neck Surgery. He was Member-at-Large for the AAO-HNS Board of Governors. He is Chair-Elect for the AAO-HNS Board of Governors, making him the first African American to hold this office. He received the AAO-HNS Honor Award and was named the American Rhinologic Society's inaugural Chief Diversity Officer. He is also a member of the AAO-HNS Program Committee. He was appointed to serve on the Advisory Board of the Dr. Levi Watkins, Jr. Institute. He founded the Dr. Troy D. Woodard Athletic Scholarship at DePaul University.

NEW STAFF



Swathi Appachi, MD, is a fellowship-trained pediatric otolaryngologist. Her specialty interests encompass the scope of pediatric otolaryngology, including voice disorders, vocal fold paralysis, airway management, swallowing,

congenital malformations, head and neck masses, thyroid disorders, rhinosinusitis, chronic earache, hearing loss, and care of the syndromic patient. She attended medical school at Cleveland Clinic Lerner College of Medicine of Case Western Reserve University. From there, she completed an otolaryngology-head and neck surgery residency at Cleveland Clinic and a pediatric otolaryngology fellowship at

Texas Children's Hospital.



Mamie Higgins, MD, is a fellowship-trained neuro-rhinologist. She performs the full range of rhinology and skull base surgery, with expertise in inflammatory sinus disease including revision and recalcitrant disease, cerebrospinal fluid leak repairs, and benign and malignant

sinonasal tumors. Specialty interests include nasal polyposis, extended approaches and advanced training in transorbital neuroendoscopic surgery (TONES) to decrease patient morbidity and mortality while improving outcomes. Dr. Higgins graduated from the University at Buffalo School of Biomedical Sciences and completed residency in otolaryngology at Albany Medical Center in upstate New York. She then completed her neurorhinology and skull base fellowship at the University of Washington, Seattle.

THE HEAD & NECK INSTITUTE AT A GLANCE

The Head & Neck Institute is comprised of a multidisciplinary team of 135 clinical providers who treat a wide range of head and neck disorders.

Who We Are

35	Otolaryngologists
25	Fellowship-Trained
22	Otolaryngology Residents
2	Otolaryngology Fellows
10	Advanced Practice Providers
30	Audiologists
11	Speech-Language Pathologists
5	General Dentists
5	Dental Specialists <i>(Oral and Maxillofacial Surgeon, Prosthodontist, Periodontist, Pedodontist, Endodontist)</i>
2	Dental GPR Residents*
1	Oral and Maxillofacial Resident

Research

92	Active clinical research projects
300+	Patients enrolled in clinical research projects

Our Clinical Activity (2019)

74,901	Evaluation and management visits
44,785	New patient visits
6,930	Primary surgical cases
794	Admissions
7.96	Average length of stay (days)
2.43	APR-DRG severity rating**

* GPR - General Practice Residency

** APR-DRG - All Patients Refined-Diagnosis Related Groups



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In honor of its centennial anniversary and rich history of innovation and advancements in healthcare delivery, Cleveland Clinic will present the inaugural Cleveland Clinic Prize at the 2021 Medical Innovation Summit. With a significant honorarium, the prize will be awarded to a team, organization or individual who has made a significant contribution to healthcare delivery with a focus on one or more defined areas. Details will be released in early 2021.

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