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## Abstracts

### Incidence and gravity of COVID-19 in patients with allergic rhinitis under treatment with sublingual immunotherapy

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**Objective**: To assess the incidence rate and severity of the clinical picture of COVID-19 in RA patients treated with sublingual immunotherapy compared to RA patients who do not receive this type of treatment.

**Methods**: This is retrospective cross-sectional descriptive observational research carried out through questionnaires sent by e-mail to patients with allergic rhinitis undergoing treatment at the Rhinitis and Allergy Center of the Hospital Paranaense de Otorrinolaringologia, in Curitiba/Paraná, about the period from March 2020 to March 2021. The evaluation period for these questionnaires was in October 2021. The research project was approved by the Ethics Committee for Research on Human Beings of the Hospital Paranaense de Otorhinolaryngology through protocol no. 47179721.9.0000.5529. The Informed Consent Form was obtained from all participants. The results obtained in the study were described by frequency and percentage. To compare the groups defined by the treatment with sublingual immunotherapy about categorical variables, Fisher's exact test or the chi-square test was used.

**Results**: Questionnaires were sent to 1324 patients based on the attendance record of the Rhinitis and Allergy Center of the Hospital Paranaense de Otorhinolaryngology, which contained the word ''rhinitis'' in the diagnostic field of the Clinic software used at the institution. One hundred and one patients responded to the questionnaires. Four who had been using immunotherapy for less than 12 months were excluded, as were four health professionals. The analysis presented below was based on data from 93 patients who met the study's inclusion and exclusion criteria, 55 of whom were treated with sublingual immunotherapy and 38 were not treated with sublingual immunotherapy. The evaluation of the homogeneity of the groups defined by the treatment with sublingual immunotherapy (yes or no) in relation to demographic and clinical variables was performed as follows: for each of the variables analyzed, the null hypothesis was tested that the distributions over the classifications of the variable are the same for cases treated with sublingual immunotherapy and cases not treated with sublingual immunotherapy, versus the alternative hypothesis that the distributions are different. Twenty patients (36.4%) who are not undergoing immunotherapy treatment had confirmed COVID-19, against eight patients (21.1%) in the immunotherapy group. However, this data was not statistically significant. Regarding the severity of the condition, most patients in both groups reported having mild symptoms, which was also not significant.

**Discussion**: Allergic rhinitis is an inflammatory disease mediated by immunoglobulin E (IgE). Symptoms occur with patient exposure to the allergen. It is a widely prevalent condition that results in physical sequelae and recurrent morbidities (WISE et al., 2018; ARAUJO et al., 2016). The researched sample indicated a predominant age group between 18 and 44 years, since minors were not included in the study. Eifan et al. (2016) and Sakano et al. (2018)

highlight a higher prevalence among children, due to a hyperactive response of T helper (Th) 2 lymphocytes, which initiate an IgE-induced systemic reaction, repressing the immune system until it is mature. Wise et al. (2018) demonstrate in their population-based studies increases in the prevalence of AR in adults in recent decades and that its prevalence in the United States is estimated between 11% (medical diagnosis) and 33% (self-report).

**Conclusion**: There was no statistically significant difference between the incidence rate and severity of COVID-19 in patients with allergic rhinitis treated with sublingual immunotherapy compared to patients with allergic rhinitis not receiving this type of treatment.

**Keywords**: Allergic rhinitis; Sublingual immunotherapy; COVID-19.

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## Correlation between measurements made on 3D photographs, degree of sleep apnea and quality of life in patients undergoing polysomnography

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**Objectives**: The aim of this research is to use 3D analysis of the facial surface of linear and angular measurements to correlate with the presence and degree of OSAS and its relationship with quality of life in patients undergoing polysomnography.

**Methods**: The study was approved by the Institution's Human Research Ethics Committee under number 47206821.3.0000.5529. This is a cross-sectional, comparative, analytical study. Patients were recruited from the Hospital Paranaense de Otorhinolaryngology with clinical suspicion of obstructive sleep apnea and who were referred for diagnostic polysomnography. Male and female patients aged at least 18 years, of all races/ethnicities, who underwent polysomnography, from August to October 2021, at Hospital Paranaense de Otorrinolaringologia and who agreed to participate in the study were included. study by signing the Free and Informed Consent Term (ICF). Participants who did not adequately answer the questionnaires and those who did not volunteer to carry out the questionnaire, in addition to those under 18 years of age, were excluded.

**Results**: The results showed that the 17 patients submitted to the polysomnography exam presented a mean FOSQ-10 equal to 14.82, 50% of the patients presented a score greater than 15. The Functional Capacity domain of the SF-36 presented the highest mean value ($\mu = 80$). The AHI presented an average equal to 19.46, 50% of the patients had an index greater than 16.20. The mean oxyhemoglobin saturation Nadir was equal to 84.47, 50% of the patients had an index greater than 87. It is verified that there is a significant difference ($p > 0.05$) in the FOSQ-10 score, for the different levels of AHI, patients with severe apnea have the lowest FOSQ-10 score ($\mu = 11.33$), while patients without apnea (AHI below 5) have the highest FOSQ-10 value ($\mu = 17.83$).

**Discussion**: Few studies in the world compare 3D photogrammetry with the degree of apnea and its repercussions on the patient's quality of life. The difficulty in capturing 3D images may be the main limiting factor for further studies, mainly due to its current cost. A consolidated tool called Vectra XT 3D for capturing 3D images costs around US$45,000, a considerable cost that prevents its dissemination. The approach for this study aimed at a practical and simpler methodology for evaluating the three-dimensional mesh of the face to study its relationship with sleep apnea. Additionally, a decrease in the quality of life of patients in the vitality domain was observed when compared to the FOSQ-10 questionnaire, showing less vitality in patients with greater functional limitation caused by apnea. As for the three-dimensional analysis of the face, it was found that the increase in the Zi-Sn/Go-Po index implies a decrease in the FOSQ-10 score, that is, the greater the impact of daytime sleepiness on the patient's activities of daily living, less vitality.

**Conclusion:** We showed that there is the possibility of acquiring a three- dimensional mesh from 2D facial images with low cost and easy access for the evaluation of facial patterns. More studies are needed to better understand the three- dimensional facial pattern and its correlation with sleep apnea. Since the beginning of studies to understand the pathophysiology of obstructive sleep apnea, retrognathism has been one of the preponderant factors. However, there is still a need for a better understanding of the anatomical relationships of the face with apnea. New studies are emerging to contribute to these answers. In this, it was possible to show that there is a more practical and lower cost method for the acquisition of three-dimensional mesh to be studied. However, it became clear that this analysis should not be for a simple mathematical analysis and more factors should be considered in more advanced studies.

**Keywords:** Polysomnography; Photogrammetry; Sleep apnea; Quality of life.

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## Evaluation of the effectiveness of facial taping to reduce rhinoplasty postoperative edema and ecchymosis

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**Objectives**: To assess whether facial taping is effective in reducing edema and ecchymosis in the postoperative period of primary rhinoplasty and how satisfied patients are with the use of this material.

**Methods**: This study was approved by the Institution's Human Research Ethics Committee through authorization no. 47968721.1.0000.5529. Prospective, longitudinal, interventional and analytical study in which patients undergoing primary rhinoplasty were divided into three groups. Group 1: control group, in which a routine dressing was performed; Group 2: routine dressing was performed and taping was applied at 10% tension; and Group 3: routine dressing was performed and taping was applied at 75% tension. Patients were photographed, answered the Rhinoplasty Outcome Evaluation (ROE) and Nasal Obstruction Symptom Evalution (NOSE) questionnaires, and underwent facial ultrasound preoperatively and in the first week after surgery. Facial image capture was performed with a thermographic camera one week after surgery. After 30 days, all patients completed the ROE and NOSE questionnaires again.

**Results:** 14 female patients were recruited, aged between 18 and 40 years, 3 from Group 1 (Control), 6 from Group 2 (taping at 10% tension) and 5 from Group 3 (taping at 75% tension). Due to the small number of cases, statistical tests of comparison and correlation between the groups were not applied. Only one patient developed a cutaneous hypersensitivity reaction, requiring the removal of the taping on the fourth day, but this was maintained in our study. All patients had higher ROE scores after the first week, as well as worsening of the obstruction, which was more significant in Group 1. Patients in Groups 2 and 3 had a lower temperature in the regions evaluated by thermography in the postoperative period in compared to the control group. All patients who used taping believe that this material helped to contain the edema and the formation of ecchymosis. As for satisfaction with nasal aesthetics, through the ROE questionnaire, there was an improvement in all groups, being even more expressive at the end of the first month, as the results showed. The increase in satisfaction with nasal aesthetics was a little less expressive in Group 2.

**Discussion:** The performance of rhinoplasty has changed significantly over the years and advances in surgical techniques have been possible, mainly, due to a better understanding of the anatomical structures and studies of great surgeons. As with any surgical procedure, there are risks of related complications. Among them, ecchymosis and edema which, because they are expected, are not necessarily described as complications. Although temporary and expected, these changes generate anxiety for the patient, even though the surgeon has advised on the favorable evolution during the first two postoperative weeks.

**Conclusion:** Taping is a practical, inexpensive and easy way to help in the rhinoplasty recovery process. This material may have a satisfactory result in the reduction of periorbital edema and ecchymosis in the postoperative period of primary rhinoplasty, in addition to contributing to less postoperative nasal obstruction when applied with a tension of 10%, bringing comfort and satisfaction to the patient. Further studies are needed to prove its benefits according to objective parameters through statistically significant data.

**Keywords:** Taping; Rhinoplasty; Post-operative; Edema.
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## Evaluation of the perception of olfactory dysfunction after Covid-19 infection and its impacts

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**Objectives**: The present study aims to assess whether or not there is a correlation between the degree of olfactory dysfunction and the affected individual's perception of the impacts of such a deficit.

**Methods**: This research was approved by the Research Ethics Committee under number 47193821.5.0000.5529. The study is based on the evaluation of patients aged 18–65 years, with a history of Covid-19 infection associated with a complaint of altered smell that started during the acute phase of the disease and continued 1 month after the onset

of symptoms. The inclusion criterion was the existence of proof of infection by Covid-19 through previous RT-PCR, performed during the acute phase of symptoms. Patients with a history of pre-existing hyposmia to Covid-19 infection, as well as individuals with chronic rhinosinusitis, a history of traumatic brain injury, skull base surgery or neurodegenerative diseases were excluded.

**Results:** The study included 20 patients with complaints of persistent smell alteration, with a minimum time of 1 month after the acute infection by Covid-19. The age group of the participating individuals ranged from 18 to 58 years, with a mean of 40.1 (±11.6) years. It is observed that, during the interview, half of the patients (50%) reported no perception of progressive improvement since the acute condition, and an equal number of patients (50%) had already started some treatment for the olfactory deficit under medical supervision. or not, the treatments being reported: olfactory training with homemade substances (15%), olfactory training with 4 pre-defined odors (25%) and medications (35%). Among those who reported the use of medication, the use of topical nasal corticosteroids alone (28.6%), alpha lipoic acid alone (28.6%) and the association of topical nasal corticosteroids and alpha lipoic acid (42.9%) stand out. It is shown that 45% of the participants reported a previous situation of exposure to danger due to the olfactory deficit, namely, the consumption of inappropriate food (44.4%), the non-perception of exposure to the flammable substance (22.2%) and non-perception of a nearby burning object (11.1%), in addition to the consumption of inappropriate food and non- perception of exposure to exposure to a flammable substance when reported by the same individual (22.2%). There was a report of hyposmia in all participating patients, considering that this complaint represented an inclusion criterion for the present study, although there was an association with parosmia (30%), phantosmia (50%) and taste alteration (75%). When asked to give a score on a one-dimensional scale of 0-10 for their olfactory function, participants reported scores that ranged from 1 to 7, with a mean of 3.7. The grades given for the degree of overall perceived impact ranged from 2 to 10, with an average of 6.0. Statistical analysis with estimation of Spearman's correlation coefficient showed a direct correlation between the low scores given for smell in the patient's perception and lower values in the total score of the olfactory test ($p < 0.003$; $r$ 0.63).

**Discussion:** Smell is a very important sense in the individual's interaction with the environment that surrounds him. This sense allows the identification of dangerous situations, awakens memories, helps the perception of flavors and plays an important role in interpersonal interactions. Thus, losses in this function have a great potential to impact the quality of life of the affected person, and may, for example, change diet habits, increase exposure to risk situations and generate emotional suffering.

**Conclusion:** The year 2021 was marked not only by the emergence of new cases of infection by Covid-19, but also by the recognition of sequelae left by the disease and the rehabilitation of patients affected by them. In this context, olfactory dysfunction stands out, which despite being short-lived in most cases, can be long- lasting and generate great compromise in the quality of life and safety of the individual.

**Keywords:** Olfactory impairment; Hyposmia; Covid-19.

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## Study of the otoprotective effect of dexametasone in ototoxicity induced by cisplatin in rats

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**Objective**: To evaluate the protection capacity of dexamethasone against the ototoxicity of cisplatin through the functional evaluations by brainstem evoked response audiometry (BERA) and morphological by optical microscopy.

**Methods:** Male Wistar rats were divided into four groups: 1. Control: 06 animals received saline intraperitoneal (IP) 8 ml/kg/day for four days; 2. CDDP + D15: 11 animals received dexamethasone 15 mg/kg/ day via IP and 90 minutes (min) after 8 mg/kg/day of cisplatin via IP for four days; 3. CDDP + D20: 07 animals received 20 mg/kg/day of dexamethasone via IP and 90 min after 8 mg/kg/day of cisplatin via IP for four days; 4. C + CDDP: 11 animals receive 8 ml/kg/day of saline via IP and 90 min after 8 mg/kg/day of cisplatin via IP for four days.

**Results**: Based on the results of this study, dexamethasone at the dose of 15 mg/kg/day was significantly protected against ototoxicity of cisplatin by means of the functional evaluation by BERA and morphological, through the preservation of vascular stria. There was no protection against systemic toxicity, evaluated through animal weight, with the use of corticosteroids.

**Conclusion**: Dexamethasone at a dose of 15 mg/kg/day protected against ototoxicity by cisplatin in functional evaluation by BERA and morphological by optical microscopy, but did not protect against systemic toxicity.

**Keywords**: Ototoxicity; Cisplatin; Dexamethasone.

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## How many maneuvers are required for the effective treatment of posterior duct canal bppv ductolithiasis

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**Objectives**: To prospectively and randomly assess the number of Epley maneuvers necessary for the treatment of patients with posterior canal BPPV (ductolithiasis).

**Methods**: Fifty-nine patients were collected in the Otorhinolaryngology Department of the Tertiary Hospital of São Paulo and randomized in advance into 4 groups: Group

A, B, C, D in which 1, 2, 3 and 4 maneuvers were performed per session, respectively. After each maneuver, the presence of dizziness was questioned and the presence of nystagmus was analyzed; in weekly return, only considered complete improvement when the patient did not complain of dizziness or nystagmus to the Dix Hallpike maneuver.

**Results**: After statistical analysis, a homogeneous group was observed in gender, age and affected laterality. Nineteen of the 32 patients showed complete improvement in dizziness and nystagmus at the end of the maneuvers at the first contact, and of these, 18 (94.34%) patients showed complete improvement of BPPV at the first return ($p = 0.051$). Of the patients who underwent 01 maneuver per session, 81.8% presented complete improvement in the first return; of those who performed 01 maneuver, 63.6% showed complete improvement; of those who performed 03 maneuvers, 100% improved completely on the first return and among those who performed 04 maneuvers per session, 90.9% showed improvement in dizziness and nystagmus at the first return ($p > 0.05$).

**Discussion**: Dizziness and instability are prevalent pathologies (21% of the population) and represent 10.8% of the complaints of patients seeking care in otorhinolaryngology emergency rooms. Among the causes of dizziness, BPPV is the most common cause of 3 vertigo (present in 1.6–5% of the general population). Studies are important to reach a consensus on the best bpPV treatment.

**Conclusion**: The higher cure rate is not related to a higher number of Epleys maneuvers performed per session. Patients who performed maneuvers until dizziness and nystagmus ceased to show a high rate of complete improvement in return.

**Keywords**: Benign paroxysmal positional vertigo; Dizziness; Semicircular channels; Vestibular diseases; Vertigo; Treatment intention analysis; Treatment plan.

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## Influence of apoptosis inhibitors on response to mometasone furoate in patients with RSCcPN

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**Objectives**: To compare the expression of apoptosis inhibitors (APs) among patients with and without Chronic Rinosinusitis with Nasal Polyp (RSCcPN), to compare the expression of apoptosis inhibitors among patients with RSCcPN who had a good response to topical nasal corticosteroids with those who had inadequate response, and also correlate the expression of apoptosis inhibitors to inflammatory markers in patients with RSCcPN.

**Methods**: Clinical data were collected from patients with RSCcPN followed in a reference service through a quality of life questionnaire – SNOT-22, and the measurements of the endoscopic score (Lund-Kennedy) and the tomographic score (Lund-Mackay) were performed. Nasal polyp samples were collected from patients with RSCcPN (without clinical treatment for at least 1 month of recruitment) and sampled of the middle shell of the controls for analysis. Gene expression of apoptosis inhibitors (XIAP, BIRC2/IAP1 and BIRC3/IAP2) and caspases (CASP3, CASP7, CASP9 and BCL2) were measured by qRT-PCR. The dosages of pro-inflammatory cytokines (IFN-$\alpha$, IL-5, IL-33, IL-10, IL-17 and TGF-b) were measured by the Luminex method. The comparison between the group of patients with nasal polyp and controls was performed by non-paired parametric tests. The patients in the study group were also divided into good and bad responders to the nasal topical corticosteroid for the evaluation of the response to treatment. Principal Component Analysis (PCA) was used to correlate the expression of markers evaluated here with the response to topical nasal corticosteroids in patients with RSCcPN.

**Results**: The final study was then composed of 27 patients with RSCcPN (17 females; mean age $46 \pm 12.2$ years), and 16 controls (14 female; mean age $29.8 \pm 9.2$ years). We found lower expression of the three apoptosis inhibitor genes (XIAP, BIRC2/IAP1 and BIRC3/IAP2) and significantly higher expression of the cytokines IFN-$\alpha$, IL-5 and TGF-b in patients with RSCcPN compared to disease-free patients. Some patients had a very good response to the medication, while others practically maintained the same intensity of symptoms and endoscopic score. From this observation, we separate the patients into two groups, the ones with good response to topical corticosteroids and poor responders. We observed that patients who responded poorly to topical corticosteroids had significantly lower birc2/IAP1 indices when compared to those who had the best response. When associating the expression of markers with corticosteroid response using the PCA method, we identified that the markers BIRC2/IAP1, XIAP, BCL2, CASP9, IL-17 and IL-33 were increased in patients with better clinical response, while CASP7 and TGF-b were related to worse response to treatment.

**Discussion**: Inflammation with mixed pattern (T1, T2 and T3) was evidenced in patients with RSCcPN, when compared to controls. Our data suggest that the decrease in PIS is an important factor in the physiopathogeny of RSCcPN and in susceptibility to clinical treatment. Whereas PII modify the innate inflammatory cascade, the present findings reinforce the importance of the innate immunity process as an essential link between the environment, the epithelium and the chronicization of the inflammatory process, in addition to opening new perspectives on the importance of the epithelial barrier of the nasosinusal mucosa in RSCcPN.

**Conclusions**: Patients with RSCcPN showed lower expression of the 3 apoptosis inhibitor genes (IAPs) studied (BIRC2/IAP1, BIRC3/IAP2 and XIAP), in addition to significantly higher expression of inflammatory cytokines IFN-g, Il-5 and TGF-b when compared to disease-free patients. The lower expression of BIRC2/IAP1 and XIAP was also related to the worse response to nasal topical corticosteroids. Finally, we observed that the expression of BIRC2/IAP1 and XIAP was strongly associated with the expression of IL-17A, CASP9 and CASP3, weakly associated with the expression of IL-33 and IL-5 and negatively associated with tgf-beta expression, reinforcing the large participation of PHI in apoptosis and inflammatory process.

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## Revisiting the orbital complications of ARS: What classification has the best clinical applicability?

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**Objective**: This study aims to compare three classifications (Chandler, Mortimore & Wormard, e Velasco e Cruz & Anselmo-Lima), identifying which of them has the best clinical applicability to evaluate orbital complications of acute rhinosinusitis.

**Methods**: This is a transversal cohort study that evaluated all patients with diagnosis of infectious orbital affection in our hospital. Clinical data and computed tomography scans findings were collected from patients reports. All images were graded according to all three classifications evaluated in the present study and then, patients were divided into four groups: eyelid cellulitis, orbital cellulitis, subperiosteal abscess and orbital abscess. The groups were compared regarding the presence of sinus opacification, history of previous use of antibiotics, the need for hospitalization, and/or surgical treatment, the duration of antibiotics treatment, and the presence of further complication/sequelae.

**Results**: 143 patients were included; there was no significant difference regarding sex and age. In all groups, the sinuses most frequently involved were the ethmoid and maxillary. The total duration of antibiotics treatment, hospitalization rate and surgery rata were significantly lower in the eyelid cellulitis group compared to the other three. Binary logistic regression showed good prediction (AUC = 76.2) for the need for surgery in patients with ethmoid involvement. Older patients are also more likely to undergo surgery (OR 1.023 for each year of age).

**Conclusions**: Cases of eyelid cellulitis have a low association with symptoms and signs of rhinosinusitis. The division between orbital abscess, subperiosteal abscess and orbital cellulitis is necessary to predict the need for surgical treatment and the rate of further complications/sequelae. Velasco and Cruz & Anselmo-Lima's classification proved to be valid, simple and effective for categorizing cases of orbital complications of acute rhinosinusitis.

**Keywords:** Complicated acute rhinosinusitis; Orbital abscess; Orbital cellulitis; Orbital complications.

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## Piezo surgery versus conventional osteotomy: A comparative analysis of techniques

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Rhinoplasty is a constantly evolving area of facial plastic surgery. Its main objective is to improve the aesthetics and function of the nose and has in lateral osteotomy one of the fundamental steps in nasal plastic. Lateral osteotomy is usually performed to narrow the nasal dorsum or to close an open nose after a dorsal reduction. Of course, recovery from these procedures involve bruising, swelling, pain and bleeding. Extensive trauma with soft tissue injury results in prolonged postoperative complications leading to less than expected results. In order to decrease complication rates, surgeons seek to vary simple, reproducible techniques in search of the best outcome. Piezo, a surgical instrument that uses piezoelectric vibrations to cut bone tissue with a high degree of precision, has been used for rhinoplasty. Considering the few studies in the current literature, comparing this new device for nasal osteotomy with the traditional chisel method, we performed a literature review to try to establish the advantages and disadvantages of the procedure and which one is the most suitable for nasal osteotomy.

**Keywords:** Rhinoplasty; Piezo; Conventional osteotomy; Surgical technique; Nasal fractures.

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## Nasal valve: Clinical importance and surgical repairs

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Rhinoplasty is the most performed cosmetic surgery on the face and the great challenge for the surgeon is to achieve the desired result, keeping the respiratory function of the nose unchanged, since the function should never be impaired due to aesthetics. For surgeons who perform rhinoplasties, knowledge of the structure and function of the nasal valve region is essential. The valve area is a complex structure, and differentiated into a carytillaphenous and bone segment. Surgical treatment aimed at improving nasal valve function cannot follow a single reference, each case should be carefully examined in order to define the main flaw to be corrected: the narrow nasolabial angle, failure in the stability of the asa, function of the deficient internal nasal valve, the anterior septum asymmetrically symmetrically the airways causing obstruction or failing in structural and functional support to the alar cartilage complex and its junction with the upper lateral cartilages, the scroll area. We carried out a bibliographic review work evaluating the types of nasal valve insufficiency, how to perform the diagnosis, and the entire arsenal of surgical techniques that we have to treat nasal valve insufficiency. Thus, we can guide nose surgeons in the prevention of functional lesions in search of an aesthetic result and in the choice of treatment for the different anatomical, congenital or acquired alterations found in these patients.

**Keywords:** Rhinoplasty; Nasal valve failure; Surgical treatment.

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## Post-COVID-19 olfactory training: How to improve results?

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**Objective**: To evaluate the response to olfactory training (OT) in patients with persistent olfactory dysfunction (OD) post-COVID-19, in addition to clarifying whether periodic change or increase in the number of essences in OT is capable of increasing therapeutic success in these patients.

**Method**: Multicenter randomized randomized trial, including individuals with post-COVID-19 OD who remained with olfactory complaints after 4 weeks of infection. The patients were randomized into 3 groups for OT: the first group received 1 kit with classical olfactory training (OCD) with 4 essences, the second received modified TO (TOM) (3 different kits with 4 essences in each, with monthly toggle of the kits) and the third received advanced TO (TOA) (3 kits with 8 essences each, with monthly alternation of the kits). All patients underwent a complete ENT physical examination, followed by subjective measurement of smell and taste through the Visual Analog Scale (VAS), in addition to psychophysical evaluation through the Smell Identification Test of the University of Pennsylvania (UPSIT). The evaluation was repeated after 12 weeks of follow-up.

**Results**: Of the 340 patients initially selected, 77 patients between 18 and 60 years of age were followed, with the following distribution: 25 patients in the OCD group, 23 in TOM and 29 in TOA. The groups had homogeneous distribution regarding age, gender, history of smoking, magnitude of the complaint in the infection and interval between infection and initiation of treatment. In all groups, there was a statistically significant improvement after 12 weeks in both UPSIT ($p < 0.0001$) and VAS ($p$ 0.001). The mean increase in UPSIT was 2.8 points and subjective improvement occurred in 74% of patients. In the comparison between the groups, there was no statistically significant difference between OCD, TOM and TOA both in the psychophysical test and in the subjective evaluation of smell and taste. Among the factors related to the therapeutic response, a negative correlation was found between the COVID-19 interval and the beginning of treatment and the increase in the UPSIT score with treatment ($p$ 0.032), but with a weak correlation (Spearman's correlation coefficient 0.24). In patients who reported olfactory fluctuation (periods of improvement and worsening) at the first visit, the UPSIT score was significantly higher both in the first evaluation ($p < 0.001$) and after 12 weeks ($p$ 0.001).

**Discussion**: Several studies continue to reinforce the central role of OD in the treatment of persistent OD1, but little is known about post-COVID-19 OD and it is very interesting to know how to optimize its results. In the present study, in 12 weeks of OT there was an improvement in both the UPSIT score ($p < 0.0001$) and the VAS ($p$ 0.001). This was the first study to compare the response to OCD and the variations performed, however, we did not obtain statistically significant differences between the OT groups. Rezaeyan et al. compared periodic alternation of odors with OCD and also found no difference. However, when studying post-infectious OD, Altundag et al., OT with alternating essences was higher than OCD at 36 weeks, but this difference was more significant only after 12 weeks. In the evaluation of the general group, patients who started OT early obtained significantly higher scores in the UPSIT, reinforcing the importance of not delayed the beginning of treatment. Olfactory fluctuation at the onset of OT was associated with better prognosis which may suggest that this symptom is related to neuroepithelium regeneration.

**Conclusion**: The data indicate that the early precocity of OT in patients with persistent OD post-COVID-19 is associated with better response, whereas periodic change or increase in the number of essences for 12 weeks is not superior to the classical method. In addition, a fluctuating olfactory ability at the beginning of treatment seems to be related to a better UPSIT score.

**Keywords**: Olfaction; COVID-19; Rehabilitation.

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## Correlation between acute inflammatory markers and late evaluation of post-COVID olfactory function

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**Objectives**: To evaluate the relationship between late olfactory function in post-COVID-19 patients and serological inflammatory markers in the acute phase.

**Methods**: Cross-sectional, analytical and observational study. A number of 123 patients with a history of hospitalization by COVID-19 were recruited. Olfactory dysfunction (OC) was evaluated using the Connecticut Chemosensory Clinical Research Center (CCCRC) test, and data from the medical records were reviewed regarding serological markers of acute systemic inflammation – lymphocytes, lactate dehydrogenase (LDH), ferritin, C-reactive protein (PCR) and D-dimmer.

**Results**: The mean interval between onset of COVID symptoms and the CCCRC test was 172 days. There was a significant association between age over 60 years and CCCRC ($p = 0.03$). It was verified the presence of a relationship with statistical significance between increased LDH values and worse score in the CCCRC ($p = 0.049$). However, the correlation found was weak ($r = 0.19$). The other markers evaluated did not present statistical significance when crossed with CRF. The result was similar in the cross between serum inflammatory markers and degree of severity of OD.

**Discussion**: In the presence of the pandemic by COVID-19, OD has become a complaint of high prevalence, leading to an important loss of quality of life for patients. According to Cazzola et al., the cells that express the angiotensin-

2-converter enzyme – including the nasal epithelial cells – are the target of attack for SARS-CoV-2. The attack on cells triggers the appearance of an inflammatory storm. The correlation between the severity of the infection and the degree and duration of OD is controversial. Although the relationship between worse olfactory score in the acute phase with exacerbated systemic inflammation and worse clinical outcomes has been reported, some studies have shown contradictory results. Mangia et al. demonstrated worse olfactory score in the acute phase in patients with worse clinical outcomes. However, Vaira et al. found no correlation between OD and poor prognosis. Similarly, Izquierdo-Dominguez et al. observed that the frequency of OD was more prominent in outpatient cases without pulmonary involvement. Regarding systemic inflammatory markers, studies have observed a relationship between elevated serum levels with the most severe forms of COVID-19, due to cytokine storm. The relationship of serum biomarkers with the highest severity of infection has also been constant in research. Chen et al. found higher CRP level in the severe group, but without statistical significance. Meta-analysis conducted by Zeng et al. demonstrated higher serum ferritin levels in patients with severe COVID-19. Izquierdo-Dominguez et al. observed in multivariate analysis that hospitalization and increase in serum CRP levels were associated with better olfactory. Analyzing the relationship between serological inflammatory markers in the serological phase and OD, Vaira et al. described that the correlations between olfactory and Serum levels of inflammatory markers were weak and not significant. In the present study, despite the statistically significant association between LDH levels and the CCCRC, the estimated correlation coefficient is low, corresponding to a weak correlation. In crossing the LDH with the degrees of severity of the CCCRC, no statistical significance was found. On the other than the other serum markers evaluated, the other serum markers did not present a significant correlation with the psychophysical test and were not associated with the degrees of severity of the CCCRC. The results found in this study are compatible with vaira et al. and Izquierdo-Dominguez et al., which may suggest little influence of systemic inflammation on the nasal mucosa.

**Conclusion**: The present study suggests that there is no relationship between high levels of serum markers – CRP, lymphocytes, D-dummy and ferritin – with worse late olfactory function in the post-COVID-19 patient. A low-grade correlation is observed between LDH and CCCRC; however, this association was not relevant when correlated with the degree of severity of OD.

**Keywords**: Coronavirus; Olfactory dysfunction; Inflammatory markers.

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## Comparison among three brands of budesonide in the treatment of allergic rhinitis: An open label, randomized clinical trial

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**Objective**: To compare the efficacy of topical nasal budesonide brands available in Brazil in the treatment of allergic rhinitis (AR).

**Methods**: An open label, randomized clinical trial was conducted, involving patients with a confirmed diagnosis of AR. Fifty-seven individuals were randomized into three groups. Each group underwent a 30-day treatment cycle with one of the three brands of topical nasal budesonide currently available in Brazil: Budecort Acqua. (brand-name), Busonid. (brand-name) and Noex. (generic). Each patient was submitted to olfactory function tests (University of Pennsylvania Smell Identification Test, UPSIT), nasal obstruction questionnaire (Nose Obstruction Symptom Rating Scale, NOSE), Peak Nasal Inspiratory Flow (PNIF) and the Rhinitis Control Assessment Test (RCAT) before and after treatment. The results were analyzed using Analysis of Variance ANOVA (complemented by Tukey's test) and Kruskal–Wallis, for comparison purposes among the three groups.

**Results**: Nineteen patients received Budecort Acqua, 19 Busonid and 19 Noex. Of the 57 randomized patients, 50 returned for data collection after 30 days of treatment. The number of dropouts was not statistically significant among the groups ($p = 0.13$). All tests UPSIT, PNIF, NOSE and RCAT, significantly improved after 30 days of intervention in the three groups studied ($p < 0.01$). None of the tests showed a statistically significant difference when compared among the groups, both pre and post-treatment values, in both ITT and PP data analyses, UPSIT ($p = 0.24$ and $p = 0.26$), PNIF ($p = 0.83$ and $p = 0.79$), NOSE ($p = 0.74$ and $p = 0.58$) and RCAT ($p = 0.23$ and $p = 0.14$). No serious adverse effects were reported in any of the three groups analyzed by the present study.

**Conclusions**: This study showed that the generic form of nasal budesonide and two corresponding brand drugs have similar efficacy in the treatment of AR. Further trials are required to compare the efficacy and safety of generic and brand-name drugs on a long-term basis.

**Keywords**: Allergic rhinitis; Corticosteroid; Treatment.

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## Asymptomatic SARS-COV-2 infection in children's tonsils

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SARS-CoV-2 pandemic killed over 6 million people worldwide. Although COVID-19 is mainly known for lung infection, several extrapulmonary tissues had been described as infected by SARS-CoV-2 during the acute disease. At least for the initial variants, children were supposedly less exposed to the virus, predominantly presenting mild or asymptomatic infection. In the present study, we describe how SARS-CoV-2 can silently infect palatine tonsils and adenoids from asymptomatic children. We studied 48 children who underwent adenotonsillectomy between October 2020 and September 2021. None of them had experienced signs or symptoms of acute upper airway infection in the month prior to surgery. Nasal cytobrush, nasal wash and adenotonsillar tissue samples were tested by RT-PCR, immunohistochemistry (IHC), flow cytometry and neutralization assay. SARS-CoV-2 was detected in at least one sample in 12 patients (25%). SARS-CoV-2 genome detection rate was 20% in the tonsils, 16.27% in the adenoids, 10.41% of nasal cytobrushes and 6.25% of nasal washes. IHC confirmed the presence of SARS-CoV-2 nucleoprotein in 15 out of 16 positive tonsils samples, both in epithelium and lymphoid compartment. Flow cytometry revealed that CD123+ dendritic cells were the most frequently infected cell type (10.57%) followed by CD14+ monocytes (6.32%), CD4+ T lymphocytes (1.75%), CD20+ B lymphocytes (1.67%), and in less extent CD8+ T lymphocytes cells (1.36%). In conclusion, tonsils and adenoids are important sites of SARS-CoV-2 infection in asymptomatic children. Positive immunostaining in adenotonsillar tissue samples suggest that lymphoid tissue can be a reservoir of SARS-CoV-2 and may play an important role in community dissemination. It remains unclear for how long the lymphoid tissue can sustain the SARS-CoV-2 in a persistent infection, and whether this persistence has any impact on virus transmission.

**Keywords**: COVID-19; SARS-CoV-2; Children; Tonsils; Adenoid.

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## Surgical results and clinical performance of an active transcutaneous osseointegrated implant

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**Objective**: To investigate the surgical results and clinical performance of an active osseointegrated implant system with piezoelectric technology.

**Method**: National, prospective multicenter study of repeated measures. The study was approved by the Ethics Committee under opinion CEISH 0559-2019. Patients with conductive or mixed hearing loss in the ear to be implanted with quadritonal mean (MQT4 = mean of 0.5, 1, 2 and 4 kHz) of bone pathway thresholds for pure tone of up to 55 dB NA were included. Patients with unilateral sensorineural hearing loss (PANU) who were candidates for osseointegrated implant surgery were also included. Surgical parameters, functional gain (GF) and self-perception of benefits were evaluated. Surgical data were recorded on an electronic data collection platform. The funiconal gain was obtained by comparing the pre-surgical audiometric thresholds without assistance, with the post-cirugic thresholds with the implanted system, in a free field with the speaker positioned at @@0. Azimuth 1 meter from the participant's head. Participants also completed the COSI questionnaires reporting subjective expectations and perceptions of benefit.

**Results:** Between June 2020 and July 2022, 380 participants aged 5–73 years were included; 87% adults, 52% men, 50% of devices implanted in the right ear and 19% bilateral. Most patients had a diagnosis of conductive hearing loss (61%) followed by mixed hearing loss (24%) and the remainder of PANU. Among the surgeries, 13% corresponded to the conversion of other devices to piezoelectric. The surgeries lasted an average of 53 min. The average skin thickness was 5.7 mm with only 22% soft tissue reduction and 7% bone polishing. The mean FREE-FIELD GF observed for pau cases was 65.4 dB. In conductive hearing loss, the mean GF obtained was 41.2 dB and finally in mixed hearing loss, the GF observed was 47.9 dB. The comprehension of speech in noise was pointed out as the main issue to be improved with the device and the improvement was reported by the patients.

**Discussion**: A new active transcutaneous BCHI design using piezoelectric stimulation for rehabilitation of patients with LHC, MHL, or SSD was clinically evaluated in this national multicentric clinical investigation. Surgical and clinical–audiological results collected during the 6-month follow-up period demonstrate that the system is safe and presents itself as an excellent option for auditory rehabilitation. The implant has a low profile, with fine design of the piezoelectric actuator, does not require frequent bone chopping, and when necessary, bone removal is minimal compared to other active transcutaneous systems, which

require the electromagnetic actuator to be Indented. This ability to place the actuator on the bone surface and design of componente único do implante, permite alguma versatilidade cirúrgica, culminando em uma cirurgia mais simples e rápida. O tempo de cirurgia, embora seja curto, tende a surgeons become familiar with the procedure, reaching cases of 30 min of surgical time. Transcutaneous systems generally result in lower rates of complications compared to percutaneous systems, and this was reflected in our safety data. Few complications have been reported and the complications are mostly considered mild. The device provided a statistically significant improvement in the comparison of thresholds with and without the device, including in the high frequency region, between 4000 and 6000 Hz. It is worth commenting that in implantable hearing aids or not, no acoustic gains above 4000 Hz are expected. accompanied by the greater distance between the actuator and the sound processor.

**Conclusion**: These results confirm the clinical safety, performance and benefit of an innovative active transcutaneous bone conduction implant using a piezoelectric transducer design in individuals with conductive hearing loss, mixed hearing loss, or unilateral sensorineural deafness.

**Keywords**: Deafness; Implant; Piezoelectric; Hearing aid.

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## Sinaptical transmission in brainstem auditory structures in patients with tinnitus treated with nimodipine: A randomized clinical trial

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**Objective**: To evaluate the synaptic transmission in brainstem auditory structures in patients with chronic subjective tinnitus treated with nimodipine.

**Methods**: Randomized, triple-blind clinical trial, which selected 40 patients (number close to that suggested by previous sample calculation) allocated equally and randomly in intervention and control group. At first, the brainstem auditory evoked potential (AEP) was performed with a click stimulus of 80 dB for both ears and the tinnitus handicap inventory (THI) and Visual Analog Scale (EVA) questionnaires were applied for intensity and discomfort in each ear. Demographic data were collected with each participant; the characteristics of tinnitus; associated symptoms; factors of improvement or worsening; and personal history. Participants were instructed to take one tablet per day for 30 days of nimodipine at a dose of 30 milligrams or placebo, which were previously manipulated into identical-looking tablets and delivered to participants. After this period, in a second moment, the participants were submitted to a new APE and THI and EVA questionnaires. From the collected data, descriptive and comparative statistical analysis was performed.

**Results**: The study had the participation of 38 patients, 18 of which were allocated in the control group and 20 in the intervention group, and 2 participants from the control group were excluded from the study due to the discontinuity of the taking of the tablets. The descriptive analysis of the data obtained in the interrogation was similar between the groups, with a predominance of elderly and female participants. Tinnitus was mostly referred to as continuous, ''in cicada'', modulated mainly by noise or stress and usually associated with hypoacusis. Most participants had at least one chronic disease and reported poor sleep quality and exacerbated consumption of xanthenes and sugars in the diet. The comparative analysis of wave latency between the two AEP tests showed a significant difference for wave ncy III and V, with increased values, only in the intervention group. The comparative analysis of the interpeak intervals between the two AEP tests showed a significant difference for the I–III and I–V intervals, with an increase in the values, only in the intervention group. The comparative analysis of the THI and VAS questionnaires showed no significant difference in both groups.

**Discussion**: The results of this study allow us to assume that nimodipine, a specific calcium channel blocker for the ''Type L'', has action on the central auditory processing pathway, delaying the formation of waves in the topography of the Superior Olivar Complex, where wave III originates; and in the Lateral Lemnisc or Inferior Colliculus, where the V wave originates. These changes would lead to a delay in the afference of the auditory pathway's synaptic transmission and would act in reducing the perception of tinnitus. Previous studies have suggested that nimodipine has neuroprotective action, helping to maintain the integrity of neuronal and peripheral pathways; and otoprotective, preventing injury to ciliary cells and improving blood flow in the cochlea. Studies at higher doses or over a longer period may be an alternative to define whether nimodipine is effective in treating tinnitus. No previous studies were found that tested the use of nimodipine in humans to evaluate tinnitus objectively through the APE; and subjective through THI and EVA.

**Conclusion**: Nimodipine at a dose of 30 milligrams per day for 30 days in individuals with bilateral chronic subjective tinnitus has evidence to alter the synaptic transmission in brainstem structures. On the other hand, there was no significant improvement in tinnitus complaints reported by patients through the THI and EVA questionnaires.

**Keywords**: Tinnitus; Nimodipine; Brainstem auditory evoked potential; PEATE; BERA; Tinnitus handicap inventory; THI.

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## Fibroblast concentration in the vocal folds of the elderly

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After ageing, the larynx undergoes structural and functional alterations, called presbyphony, which can compromise the vibratory pattern of the vocal folds and negatively affect the voice. Among the various structural changes, there are the increase in the extracellular fibrous matrix and the decrease in hyaluronic acid. As fibroblasts are important components of the lamina of vocal folds, responsible for the production of collagen and elastic fibers, we consider it important to know the behavior of these cells in the larynx of the elderly to better understand the pathophysiology of presbyphony.

**Objective**: To study the concentration of fibroblasts in the vocal folds of the elderly by immunohistochemical analysis.

**Material and methods**: The vocal folds of 13 cadavers were distributed into two groups (n-5, age between 18 and 40 years; n-8, age above or equal to 75 years), dissected and prepared for immunohistochemical analysis using the Antibody S100 (AB 41532-ABCAM. Cambridge, Cambridgeshire), for fibroblasts. The sites analyzed were flavaic macules and medial (or vibratory) part of the vocal folds. The image J program was used for cell counting.

**Results**: Higher concentration of fibroblasts was identified in the flavaic macules of the larynxes of young adults and in the medial part of the vocal folds of the elderly. However, these results did not determine statistically significant differences, allowing us to affirm that there was no effect of age on fibroblast concentration in the vocal folds.

**Discussion**: The fact that we did not identify quantitative changes in fibroblast concentration in the larynxes of the elderly when compared to the larynxes of young adults, allows us to assume that there are qualitative functional alterations in these cells capable of altering their behavior.

**Conclusion**: In the larynx of the elderly, the fibroblast population remains similar to that observed in the larynxes of young adults, both in flavaic macules and in the body of the vocal folds, possibly responsible for the constant production of fibrous matrix in the lamina itself. Functional changes in these cells are probably more marked than quantitative ones.

**Keywords**: Presbyphonia; Vocal folds; Elderly; Fibroblasts.

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## Use of corticosteroids in the treatment of periamigdalian abscesses: Is there benefit?

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**Objective**: To evaluate the benefits related to the use of corticosteroids in the adjuvant treatment of patients with periamigdalian abscess.

**Material and methods**: A retrospective study was conducted in a tertiary hospital of patients treated by the Otorhinolaryngology Service of the Institution, from March 2018 to February 2022. The following data were collected from the patients: gender, age, duration of disease evolution, use of medications before hospitalization, use of corticosteroids during hospitalization, antibiotic used, volume of abscess evaluated by computed tomography, drainage, drained volume, leukocyte count (leukogram) at hospital admission and after 48 h, Protein C reactive (PCR) on hospital admission and after 48 h, symptoms at hospital admission, clinical evolution during hospitalization and isolated microbiological agent.

**Results**: 90 hospitalized patients diagnosed with periamigdalian abscess were evaluated. The following parameters were not influenced on the size of the abscess: duration of disease evolution, previous use of anti-inflammatory drugs, age group, length of hospitalization (days) and leukogram at hospital admission and after 48 h. In patients who used corticosteroids, no statistically significant reduction in pain was observed, in the duration of hospitalization and in the duration for acceptance of a general oral diet ($p = 0.490$, $p = 0.775$ and $p = 0.465$, respectively).

**Conclusion**: The use of corticosteroids as adjuvant therapy in patients with periamigdalian abscess has no benefits concerning pain control, reduction in length of hospitalization or duration for acceptance of the general oral diet.

**Keywords:** Periamigdalian abscess; Corticosteroid; Pharyngeal infections.

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## Thyroplasty type-III, results

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**Objectives**: This study aims to validate the hypothesis that type III thyroplasty achieves its objective and makes the patient's voice more severe. This technique was first

reported by Isshiki et al. in 1974, and consists of reducing the posterior anterous diameter of the thyroid cartilage. Partial resection of this cartilage results in the relaxation of the vocal cords and decreased tension on them, making the voice more severe and decreasing its fundamental frequency.

**Methods**: For this analysis, the fundamental frequency of the voice and the score obtained in the Vocal Handicap Index-10 (IDV-10) pre- and post-surgical of the patients of the Hospital Instituto Paranaense de Otorhinolaryngology of Curitiba submitted to relaxation thyroid is performed by a medial approach between 2018 and June 2022, totaling 30 cases of cisgender male participants diagnosed with a mutational falsetto. The patients were operated by a single surgeon, using the same technique in all procedures, in order to enable a verisimilcomparison between the sample. The ''paired sample *t*-test'' was used for statistical analysis.

**Results**: The mean preoperative Fo in the sample ($n = 30$) was 179.76 Hz (standard deviation of 17.03, standard error of 3.11). When evaluated after six months of the procedure, the mean Fo decreased to 109.16 Hz (standard deviation = 6.49, standard error = 3.11, $p < 0.001$), proving the effectiveness of surgery in reducing voice Fo. The preoperative IDV-10 had a mean score of 22.87 (standard deviation = 6.95, standard error = 1.268). When evaluated six months after the procedure, the score decreases to 4.10 (standard deviation = 2.31, standard error = 0.422, $p < 0.001$), showing a great positive impact of surgery on the function of the participants' voice.

**Discussion:** Analyzing the results, it is confirmed the hypothesis that type-III thyroplasty presents the expected results, making the voice effectively more severe, due to the significant reduction of Fo. The procedure also shows to achieve the expectations of patients, improving their quality of life, especially in the social aspect, through a large decrease in the score in the IDV-10 questionnaire after surgery, an important parameter validated with adequate psychometric properties of validity, reliability and sensitivity to promote its use in the evaluation of individuals with dysphonia. With 30 patients, the present study, therefore, can be considered an unprecedented compile of the comparison not only of the alteration of fo by the type III thyroplasty process, but also of the subjective perception that such change causes in the quality of life of the participant (IDV-10), proving the validity of this surgical procedure.

**Conclusion**: Voice plays an extremely important role in social interaction and in the construction of personal identity, so the patient's dissatisfaction with his own voice has a great impact on his quality of life, directly affecting his/her health status. The results of the study prove the efficacy of type-III thyroplasty in reducing the fundamental frequency of voice. Therefore this procedure may be indicated for cisgender or transgender men dissatisfied with their tone of voice, even after speech therapy and/or hormone therapy with testosterone.

**Keywords**: Type-III thyroplasty; Vocal surgery; Fundamental frequency; Pubertal.

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## Tomographic changes of the paranasais sinuses of patients with Covid-19

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**Objective**: To verify the presence of tomographic alterations in the paranasais sinus of patients diagnosed with Covid-19 and to evaluate the presence of an association between olfactory symptoms and the involvement of these sinus.

**Methods**: This is an observational cross-sectional study that analyzed computed tomography of the nose and paranasal sinus (SSCT) of patients with Covid-19 regarding the presence of mucous thickening in the paranasal sinus. Patients who underwent RT-PCR examination for detection of Covid-19 (SARS-CoV-2) and TCSPN infection from March 2020 to March 2021 were included. Patients with a history of previous nasosinusal surgery, recent facial trauma, age below 18 years or with incomplete information in medical records were excluded.

**Results**: A total of 65 individuals were included, of whom 28 were diagnosed with Covid-19. In tomographic analysis, an association was observed between Covid-19 infection and mucous thickening of the bilateral maxillary sinus ($p = 0.038$) and mucous thickening of the bilateral ethmoidal sinus ($p = 0.005$). No significant association was found between mucous thickening of the sphenoid and frontal sinus with virus infection. The complaint of olfactory dysfunction was reported by 20% of the patients, with no association with tomographic alterations or Covid-19 infection.

**Conclusion**: Covid-19 virus infection possibly causes an injury to the mucosa of ethmoidal cells due to the inflammatory process resulting from viral infection. The lesion of the mucosa of the ethmoidal sinuses may cause alteration in the drainage physiology of the maxillary sinuses due to blockade of the middle meatal tract – site of drainage of the maxillary sinus – and lead to edema of the mucosa of this sinus. This change in the mucosa of the ethmoidal sinus may also be the cause of olfactory disorders presented by patients, as well as may cause lesions in the olfactory nerve.

**Keywords**: Covid-19; SARS-CoV-2; Anosmia; Tomography; Paranasal sinuses.

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## Evaluation of vestibular function of patients with temporal bone fracture through the video head impulse test (vHIT): Preliminary results

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**Objectives**: To evaluate the vestibular function of patients victims of traumatic brain injury (TBI) and temporal bone fracture by means of *the video head impulse test* (vHIT).

**Methods**: Observational cross-sectional study. Patients with temporal bone fracture treated at a tertiary hospital referred to trauma were included. Patients with previous diagnosis of vestibular disease and using vestibular suppressive medication were excluded. The presence of vestibular and auditory signs and symptoms at the bedside was verified. Around the 30th day after the trauma, the patients underwent the vHIT examination. The presence of an association between alteration in vHIT and type of fracture, optic capsule involvement and vertigo symptom were analyzed by Fisher's exact test. Values of $p < 0.05$ indicated statistical significance.

**Results**: Twenty-two patients, all male, with a mean age of 42.1 years were included. The most prevalent mechanism of trauma was bicycle fall (41.7%). In 66.7% of the cases the fracture was on the right. Regarding the type of fracture, 83.3% were longitudinal, 8.3% transverse and 8.3% mixed. There were only 1 case (8.3%) of optic capsule involvement in the fracture. Only 6 (50%) were submitted to vHIT. The patient with fracture involving the optic capsule presented labyrinthine hypofunction in the anterior, lateral and posterior ipsilateral canal to the fracture. The analysis of the presence of association between alterations in the vHIT exam with the presence of vertigo, type of fracture and involvement of optical capsule showed no statistical significance ($p > 0.04$). Only 1 underwent the audiological examination, presenting moderate mixed hearing loss.

**Conclusion**: Vestibular evaluation through vHIT has been increasingly used. It is noteable that although they are preliminary results, the present study shows originality when investigating the theme through vHIT in patients with temporal bone fracture.

**Keywords**: Craniocerebral traumas; Head impulse test; Cranial fractures; Dizziness.

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## Evaluation of response and survival of patients with head and neck squamous cell carcinoma submitted to surgical resection as exclusive therapy at the Clinical Hospital of the State University of Campinas

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**Objectives**: Descriptively analyze epidemiological, pathological, pathological and outcome data, in addition to estimating the influence of staging, primary site and anatomopathological characteristics on overall survival and disease-free survival in patients with neck head squamous cell carcinoma.

**Methods**: Retrospective study based on the analysis of 102 patients with neck head squamous cell carcinoma submitted to surgery as a single therapy, attended at the Clinical Hospital of the State University of Campinas from 2010 to 2019. Exploratory data analysis through summary measures. The groups were compared using the Chi-Square test or Mann–Whitney test. The Kaplan–Meier estimator was used to estimate overall and disease-free survival. The survival of the groups was compared through the Log-Rank test. The factors associated with the time of death and recurrence were analyzed by Cox Regression.

**Results:** Data were collected from 102 patients. The majority had stage I or II (81.4%). Regarding the outcome, 21.6% had recurrence, 18.6% died and 84.3% had a complete response. Active smokers had lower complete response, higher risk of death and recurrence. Perineural invasion is also associated with death. The overall and disease-free survival time at 5 years was 74.7% and 69.3%, respectively. The staging and primary site of the tumor did not significantly alter the survival of the patients.

**Discussion**: This study brings important epidemiological data, shows the importance of active smoking as an important risk factor for death, tumor recurrence and in the complete response after surgery. It also shows overall survival and disease-free survival at 5 years, similar to that found in the literature. Conclusion: Surgery as an exclusive therapy in early tumor stages is an important therapeutic weapon in squamous cell carcinomas of the neck head.

**Keywords:** Head and neck cancer; Squamous cell carcinoma; Surgery; Survival.

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## Can simple chronic otitis lead to sensorineural hearing loss?

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**Introduction**: Chronic otitis media affects millions of people worldwide. According to the classification by Bluestone and Kenna, non-cholesteatomatous chronic otitis media is considered the most common part of chronic otitis media, which has tympanic membrane perforation with episodes of intermittent otorrhea and hearing loss of different degrees. The association with conductive hearing loss is well known, however, the relationship with sensorineural hearing loss is still controversial in the literature; some studies show the relationship of this pathology with damage to the inner ear that brings a serious problem in terms of personal quality of life and social impairment.

**Objective**: To evaluate the association of sensorineural loss in patients with unilateral non-cholesteatomatous chronic otitis media in a tertiary hospital.

**Methods**: Quantitative cross-sectional study, retrospective analysis of data recorded in electronic medical records of patients undergoing unilateral tympanoplasty surgery between 1984 and 2019 at Hospital Governador Celso Ramos, Florianopolis.

**Results**: In 172 patients evaluated, sensorineural hearing loss was found in the ears diagnosed with non-cholesteatomatous chronic otitis media in 27.9% compared to the contralateral ear. Observed at middle frequencies, 2000 Hz prevalence of 29.1%, that increases directly proportional to the increase in frequencies, reaching 58.7% at 4000 Hz. There was an association with disease duration, perforation size and otorrhea ($p < 0.001$).

**Conclusion**: Sensorineural hearing loss is associated with non-cholesteatomatous chronic otitis media and, the longer the duration of the disease, the worse the progression which starts in the middle frequencies and becomes even more prevalent in the higher frequencies. Reason for the importance of early surgical treatment.

**Keywords**: Otitis media; Hearing loss; Sensorineural hearing loss.

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## Alcohol sniff test (AST): Tool for screening suspected cases of COVID-19

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**Objective**: To evaluate the efficacy of alcohol sniff test as a predictor of SARSCoV2 infection in patients with flu syndrome.

**Methods**: A cross-sectional observational study was conducted between September and December 2020 in the employees of a tertiary hospital who presented mild influenza syndrome. A total of 103 individuals participated in the study, divided into three groups: flu-like syndrome and RT-PCR test positive for COVID-19; flu syndrome and negative RT-PCR test for COVID-19 and an asymptomatic control group. All patients were submitted to olfactory evaluation through the alcohol sniff test.

**Results**: Of the 103 individuals studied, 35 (33.98%) had flu-like symptoms and positive RT-PCR, 38 (36.89%) had flu-like symptoms and negative RT-PCR and 30 (29.12%) were asymptomatic. The overall mean distance of the AST test was $10 \pm 8.2$ cm. There was a statistically significant difference between the mean distance of the COVID+ groups ($4.35 \pm 4.1$ cm) and the control group ($20 \pm 4.3$ cm) ($p < 0.05$). This relationship was also maintained between the groups COVID+ (4.35 cm) and COVID− ($9 \pm 7.5$ cm) ($p < 0.05$). For a cut-off of 10 cm, the AST presented sensitivity of 88% and specificity of 41%, leading to an odds-ratio of 9.7 (95% CI 3.3–28.1) ($p < 0.001$).

**Conclusion**: The alcohol sniff test presented high sensitivity and odds ratio for COVID-19 screening in patients with mild influenza syndrome in the context of pandemic.

**Keywords:** Olfaction; COVID; Otorhinolaryngology.

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## Is the presence or absence of nasal polyposis a good marker of type 2 inflammation?

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**Objective**: To identify the association between the presence or absence of nasal polyposis and the type 2 inflammation profile.

**Methods**: A retrospective cross-sectional study of patients aged 18 years with a diagnosis of chronic rhinosinusitis followed up at the Otorhinolaryngology service of a university hospital was conducted. The patients were divided into two groups based on nasal endoscopy: group 1 (with polyposis) and group 2 (without polyposis). The characterization of the type 2 immune response was defined in relation to eosinophil count in peripheral blood >250 cells/μL, total IgE >100 IU/mL, sensitization to aeroallergens and staphylococcal enterotoxins or presence of asthma.

**Results**: 160 patients with chronic rinossinusitis were included, 137 with polyposis and 23 without polyposis. 56% were female and the mean age was 60 years. The prevalence of asthma was 89.4%, higher in patients without polyposis (70.59%) than in those with polyposis (57.14%) ($p = 0.3$). Sensitivity to some aeroallergen was 66.9%, higher in patients without polyposis (66.67%) than

in those with polyposis (42.11%) ($p = 0.1$). The prevalence of patients with eosinophils >250 cells/μL was 69.54%, higher in patients with polyposis (70.77%) than in those without polyposis (61.90%) ($p = 0.41$). The median of seeric eosinophilia was 390 cells/μL, higher in patients with polyposis (423.5 cells/μL) than in those without polyposis (310 cells/μL) ($p = 0.03$). The prevalence of patients with IgE >100 IU/mL was 55.74%, higher in patients with polyposis (56.88%) than in those without polyposis (46.15%). The median dose of erric IgE was 154 IU/mL, being 158 IU/mL in patients with polyposis and 50 IU/mL in patients without polyposis ($p = 0.1$).

**Conclusion**: There was no relationship between phenotypic and endotypic classifications, because both patients with and without polyposis presented type 2 inflammatory response markers.

**Keywords**: Sinusitis; Phenotype; Th2 cells.

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## Risk factors for laryngotracheal injury in patients with COVID-19 submitted to orotracheal intubation

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**Objective**: To evaluate the risk factors for the development of laryngotracheal lesions patients with COVID-19 undergoing orotracheal intubation (IOT).

**Method**: A prospective cohort was evaluated and approved by the Research Ethics Committee of the institution. Consecutive patients diagnosed with COVID-19 were evaluated for molecular test of RT-PCR, hospitalized in a tertiary hospital, in the period of March 1 to 31 October 2020, who required IOT. Patients who were discharged were called for outpatient follow-up and examination of the endoscopic.

**Results**: 1357 patients diagnosed with COVID-19 were hospitalized confirmed by molecular rt-PCR test in a nasal swab. IOT for ventilation mechanics was required in 421 patients (31%). In patients undergoing IOT, the outcome found was: hospital discharge – 172 (40.9%); death – 249 (59.1%). The evaluation outpatient videoendoscopy was performed in 95 patients (55.2%), on average 100 days after extubation. Statistical significance was observed for the development of laryngotracheal lesion patients who presented at the time of hospital admission the following factors: increase in leukocyte count (leukocytosis) with a reduction in lymphocyte count (lymphopenia), hypoalbuminemia, increased arterial lactate, increased troponin and increased total bilirubin; size of the endotracheal tube; indication of pronation during the IOT period; and increased leukocyte count, D-dimer, TP and INR on the date of IOT.

**Conclusions**: We observed a higher risk for the development of laryngotracheal injury patients who presented at hospital admission the increase in the leukocytes (leukocytosis) with reduced lymphocyte count (lymphopenia), hypoalbuminemia, increased arterial lactate, increased troponin and increased total bilirubin. Patients who used a larger endotracheal tube and were submitted to the pronation position, as well as patients who at the time of IOT increased inflammatory reactivity (increase in leukocyte count) or developed coagulation disorders (increased D-dimer, TP and INR), at higher risk for the development of laryngotracheal injury.

**Keywords:** COVID-19; SARS-CoV-2; Laryngotracheal susthesis after intubation; Larynx.

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## Comparative magnetic resonance analysis of olfactory bulb of individuals with post-COVID anosmia 19

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**Introduction**: The world has seen an uprise of olfactory disorders during the last years of COVID-19 pandemic, and unlike other infectious diseases, this was a more permanent alteration.

**Objective**: Assess olfactory bulb region through magnetic resonance imaging in individuals that persisted with olfactory disorder after COVID-19 infection.

**Method**: Retrospective observational study with patients with persistent olfactory disorder after COVID-19 infection (hyposmia/anosmia). Subjects underwent CCCRC olfactory testing, nasal endoscopy, and MRI. Study group was then compared to a control group, with individuals from 18 to 65 years, with no olfaction complain, and that were submitted to MRI before 2020 (pandemic period).

**Results**: Study group was of 59 adults, mean age of 44.9 (±7.4), with a slight superior number of women (64.7%). Control group has 42 individuals with mean age of 40.3 and with a slight male predominance (52.4%). In the control group, the olfactory bulb mean size was of 53.6 $mm^3$, ranging from 20.4 $mm^3$ to 139.7 $mm^3$. Study group had the following results: mean of 43.8 $mm^3$, ranging from 18.4 $mm^3$ to 90.8 $mm^3$, with $p$ value of 0.0225.

**Conclusion**: These results suggest that COVID-19 infection can be related to alterations of olfactory bulb structure that can explain persistence of olfactory.

**Keywords:** Anosmia; Coronavirus; COVID-19; SARS-CoV-2; Olfactory bulb.

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## Efficacy of injectable substances in the treatment of glottic insufficiency: A systematic review

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**Objectives**: To evaluate, through a systematic review, the results of glottic insufficiency treatments with the two most used injectable substances (hyaluronic acid or hydroxyapatite).

**Methods**: The question is whether injectable substances (hyaluronic acid or hydroxyapatite) are effective in treating patients with glottic incompetence. As criteria for inclusion of studies for this review, studies evaluating the function of the vocal folds before and after one and six months of injection of injectable substances (hyaluronic acid or hydroxyapatite), adult patient with atrophy, scars and unilateral paralysis of the vocal folds with glottic incompetence. The intervention was the use of treatments with injectable drugs (hyaluronic acid or hydroxyapatite). Control was established with adult patients with atrophy, scars and unilateral paralysis of the vocal folds with glottic incompetence, before intervênção. As outcomes, the reduction of the score in the vocal handicap index questionnaire, reduction of the scores of the auditory-perceptual evaluation of the voice by the GRBAS scale and increase in the values of the maximum phonation time were evaluated.

**Results/conclusion**: Both injectable substances, hydroxyapatite or hyaluronic acid, proved to be effective in the treatment of glottic incompetence.

**Keywords:** Glottic insuficiency; Larynx; Voice; Fillers; Vocal fold.

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## Language development in children with prelingual deafness from a public cochlear implant program

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**Introduction**: Prelingual deafness has a great impact on communication and, consequently, on cognition, school performance, emotional development and psychosocial well-being. In cases of severe-profound deafness, cochlear implants (CI) may be indicated. Many hospitals provide this treatment in Brazil through the public health system. However, there are few national studies that evaluate the performance of patients implanted in developing countries.

**Objective**: To evaluate the rate of loss to follow-up in a CI program from the public health system in Southern Brazil as well as the characteristics of hearing loss, sociodemographic, sociocultural and the development of oral language in children with prelingual deafness.

**Methods**: Retrospective cohort study with children who underwent CI surgery between 2010 and 2020. Data was collected through of interviews and review of medical records. The language development assessment was performed using the MUSS, MAIS and IT-MAIS scales. For the classification of language development we used as parameters the values (mean $\pm$ SD) found in a previous national study. From those values, the *Z* score for each patient at each hearing age (time of experience with the CI) was calculated.

**Results**: Of the 189 children implanted between 2010 and 2020, 129 were included in this study. The rate of loss to follow-up in the program was 31.7%. The mean age at first CI surgery was 40.5 ($\pm$16.9) months, with 77.5% of patients having received a unilateral implant. Language results below the expected for hearing age (<*Z* score $-1$) for the MAIS score were found in 59.7% of the sample, while for the MUSS score the proportion was 62%.

**Conclusions**: The high rate of loss to follow-up in the program is a fact that deserves attention together with the low percentage of language development of these patients. Some variables emerge as potential prognostic markers for this population and are in line with findings from other studies in the literature. However, such correlations deserve more attention in prospective and longitudinal analyses.

**Keywords**: Cochlear implant; Prelingual deafness; Language development disorders.

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## Factors associated to language development in children with prelingual deafness

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**Introduction**: Cochlear implant (CI) has as its primary objective to promote access to sounds with consequent language development. However, outcomes are not constant,

reflecting the singularity of each child, their families and the social context they come from. Many variables have been previously explored to try to determine the role of each of them in language outcomes. Nevertheless, most of the research performed on these topics is carried out in developed countries. Considering that sociodemographic and sociocultural aspects seem to play an important role in child development, it is important that more studies are conducted in developing countries.

**Objective**: To explore the characteristics related to better language outcomes in a sample of pediatric patients with prelingual deafness from a public cochlear implant program in southern Brazil.

**Methods**: Retrospective cohort study with children who underwent CI surgery between 2010 and 2020. Data was collected through of interviews and review of medical records. The language development assessment was performed using the MUSS, MAIS and IT-MAIS scales and its results were compared with the ones from a previous study so a *Z*-score could be calculated to determine if language outcomes were as expected for the time of experience with the CI. To explore association between *Z*-scores and patients characteristics (clinical, sociodemographic and sociocultural) we initially we used Pearson's correlations coefficient. This approach was followed by multivariable linear regression with stepwise forward selection.

**Results**: Of the 189 children implanted between 2010 and 2020, 129 were included in this study. The rate of loss to follow-up in the program was 31.7%. The mean age at first CI surgery was 40.5 (±16.9) months. Characteristics associated to better language outcomes such as reading habit, exposure to bilingualism and speech therapy were found for this sample.

**Conclusion**: Further analysis should be conducted to evaluate if the variables that were found in this study confirm their importance for language development in this population.

**Keywords:** Cochlear implant; Prelingual deafness; Language development disorders.

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## Relationship between unrehabilitated hearing impairment and the impact on speech recognition index

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**Objective**: Analyze the relationship among the inadequate rehabilitation of hearing loss and the influence over the word recognition score.

**Methods**: Evaluation of 102 patients separated into two groups – a group with regular use of hearing aids and a group with irregular use of them – to correlate the word recognition score between both groups.

**Results**: First group (regular use of hearing aids) showed a improve tendency of the score ($p < 0.001$) when compared to the audiometry of the moment of the rehabilitation and the last audiometry. In contrast, the second group showed a deterioration of the word recognition ($p = 0.012$) between the audiometries.

**Conclusion**: There is an association between the inadequate use of hearing aids and the worsening of the word recognition score, influencing the speech comprehension. This could lead to social impairment and, consequently, social isolation, depressive symptoms and dementia.

**Keywords**: Hearing loss; Rehabilitation of the hearing loss; Dementia.

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## Impact of xylitol solution use after septoplasty associated with inferior turbinectomy

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Nasal septum deviation correction surgery (septoplasty) associated with reduced size of lower nasal conchas (inferior turbinectomy) are very common procedures due to the high number of patients suffering from nasal obstruction due to mechanical component by nasal septum deviation and hypertrophy of lower nasal conchas. Despite being a safe procedure, it generates a series of postoperative discomforts, with potential for complications, which can be minimized by the proper visualization of structures during surgery and by the commitment to therapeutic measures in the postoperative period. There are several medications available to try to minimize such discomforts, with nasal washing with well-established saline solution and always indicated for reduction of the factors mentioned above, since it leads to the cleansing of mucus, crusts and cellular debris, reducing the probability of formation of synechia and accelerating the healing of the nasal mucosa. Other measures and medications are indicated according to the own experience of each surgeon. The present study aims to evaluate the impact of the use of the increased xylitol solution for patients undergoing septoplasty and inferior turbinectomy, since there are few studies in the literature that directly assess the action of xylitol on the nasal mucosa as well as on the quality of life of the patient during postoperative recovery.

**Keywords**: Septoplasty; Turbinectomy; Xylitol; Postoperative; Complications

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## Cervical versus superficial temporal recipient vessels in midface and scalp free tissue flap for advanced oncologic reconstruction: Prospective and randomized study

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**Objectives**: To demonstrate our surgical experience in midface and scalp advanced oncologic reconstruction using free tissue flap and to compare the postoperative outcomes based on superficial temporal versus cervical recipient vessels.

**Methods**: We performed a prospective and randomized study of patients who underwent midface and scalp oncologic reconstruction with free tissue flap from April 2018 to April 2022 in an oncologic referenced center. Two groups were analyzed: those in whom superficial temporal vessels were used as the recipient vessels and those in whom cervical vessels were used as the recipient vessels. Patient gender and age, cause and classification of the defect, flap choice for reconstruction, recipient vessels, postoperative course, and complications also were recorded and analyzed. A Fisher's exact test was used to compare outcomes between the 2 groups.

**Results**: On the basis of the different recipient vessels, 27 patients were randomized into 2 groups: those with superficial temporal recipient vessels ($n = 12$) and those with cervical recipient vessels ($n = 15$). There were 18 male and 09 female patients with an average age of $53.92 \pm 17.49$ years. The overall flap survival rate was 88.89%. The overall complication rate for vascular anastomosis was 14.81%. The total flap loss rate in patients with superficial temporal recipient vessels was higher than the complication rate in those with cervical recipient vessels but with no statistical significance (16.67% vs 6.66%, $p = 0.56$).

**Discussion**: Few articles have specifically compared the postoperative results based on recipient vessels in midface and scalp reconstruction. In this prospective and randomized study a group of 27 patients who underwent and midface and scalp reconstruction were divided into 2 groups according to the recipient vessels used. In terms of complications, no statistically significant differences were found between the groups. In our series, the overall flap survival rate was 88.89%. These data are similar to the world series that report rates above 90% of success in free flaps.

**Conclusion**: In the group with superficial temporal recipient vessels, the postoperative rate of microanastomosis complication was similar than the cervical recipient vessel group. Therefore the use of superficial temporal recipient vessels for midface and scalp oncologic reconstruction could be a reliable option.**Keywords:** Free tissue flaps; Head neck cancer; Microanastomosis; Superficial temporal vessels; Cervical vessels.

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## Follow up study of patients with sudden deafness in tertiary hospital

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**Objectives**: To evaluate the auditory improvement and quality of life in the labor and social sphere scans in patients diagnosed with sudden deafness from 2014 to 2021 treated in the Otorhinolaryngology Emergency Room of a tertiary hospital in the Federal District.

**Methods**: 50 patients were scheduled for a follow-up after the diagnosis of sudden sensorineural hearing loss with application of the reassessment protocol, anxiety scale and Beck depression. If tinnitus complains, the Tinnitus Handicap Inventory was applied. Also, they performed the otoacoustic emissions, audiometry and impedance methanime tests. This study was approved by the Ethics and Research Committee with protocol 46677821.3.0000.8153.

**Results**: Fifty patients diagnosed with sudden deafness from 2014 to 2021 in the Emergency Room of a tertiary hospital in the Federal District participated in the study. 46% of the patients underwent treatment with oral corticosteroid therapy with auditory improvement in 60.8% by the criterion of Furuhashi and Modified Siegel. In 5 cases of the studied participants, due to comorbidities that contraindicate the use of oral therapy, intratympanic corticosteroid therapy was indicated and a 60% rate of hearing improvement was observed. In 40% of the participants, the association between oral and intratympanic rescue corticosteroids was performed with good results in 35% of the cases. Of the remaining participants, 1 did not undergo treatment and 1 underwent surgery. 52% had a minimum score in the Beck Depression questionnaire and 44% had a minimum score in the Beck Anxiety questionnaire. In the THI questionnaire, 20% was severe and 26% catastrophic.

**Discussion**: Few studies address' the impact that sudden sensorineural hearing loss has on the patient's quality of life. It is compromised by the impact of vertigo, tinnitus and difficulty in sense of direction and understanding due to unilateral hearing loss. In this study, we observed a high score of depression and anxiety in patients who remained with hypoacusis after treatment. With the application of THI, this study evidenced the significant social, labor and personal impact in patients who persisted with tinnitus.

**Conclusion**: It is necessary to carry out a multidisciplinary approach of these cases due to the social and psychological impact of this diagnosis. It is important a long-term follow-up for audiological follow-up, auditory and social rehabilitation in view of the great impact of this disease on the well-being and comfort of these patients.

**Keywords**: Sudden hearing loss; Audibility assessment; Quality of life; Rebilitation of hearing loss; Tinnitus.

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## Quality of life assessment after septoplasty

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Septal deviation has high prevalence in population and it is an important cause of nasal obstruction which may decreases quality of life.

**Objective**: Assessing the impact of septoplasty in patients with deviated septum and nasal obstruction based on a quality-of-life questionnaire.

**Methods**: Prospective design. Patients undergoing septoplasty were assessed by the NOSE questionnaire before surgery, 2 months after surgery and 6 years after surgery. We evaluated the surgical improvement based on total score, the magnitude of the surgery in the disease-specific quality of life and the correlation between the preoperative score and postoperatively improvement.

**Results**: Twenty-six patients were included in the study. The mean age of patients undergoing surgery was 33.7 years. There was a statistically significant improvement in the preoperative NOSE score, after two months and after 6 years.

**Conclusion**: Septoplasty resulted in improvement in quality-of-life in adults with septal deviation and nasal obstruction.

**Keywords**: Septoplasty; Septal deviation; Nasal obstruction; Quality-of-life.

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## Susceptibility of the Swiss model to amicacine

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Amicacine causes irreversible ototoxicity and early detection of this disease is considered a difficult task. Clinical studies of the effects of amicacine in men have revealed that the drug can produce changes that cause tinnitus, hearing loss at high frequencies and behavioral manifestations. The anatomical–physiological equivalence of the peripheral auditory system of humans with mice causes this model of animal to be routinely used in clinical trials, as they contribute to the prevention, diagnosis and treatment of alterations caused by the use of this drug.

**Objective**: This study aimed to verify the susceptibility of the Murino Swiss model to external hair cell lesions caused by the use of aminoglycoside amiccin.

**Method**: Experimental, prospective and intervention research, approved by CEUA/UnB no. (63/2018). The animals were divided into two groups: control group (G1) and Ototoxic Amicacine (G2). G1 received sodium chloride (serum) solution 10 mg/kg/day and G2 received amicacin 400 mg/kg/day. The solutions were offered daily intraperitoneally for 14 consecutive days. Otoacoustic emissions were performed by distortion product at frequencies from 6 to 12 kHz in T0 and T14 and histological study of the ymimpnanic leaflets were performed. The analyses were carried out using the Prism®5 program. Differences with $p < 0.05$ were considered significant.

**Results**: The use of amicacin in a dose of 400 mg/kg/day for 14 consecutive days did not cause damage to external snare cells and cochlear structures in the SWISS model.

**Conclusion:** Swiss mice have resistance to ototoxicity of amicacine under treatment at the dosage of 400 mg/kg/day for 14 days intraperitoneally.

**Keywords:** Hearing loss; Choclea; Ototoxicity; Inner ear; Audiology; Amicacine.

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## Melatonin as prevention in age-related hearing loss in model murino C57BL/6J

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**Objective**: The present study aimed to perform a morphological and morphometric analysis of the cochlear structures of C57BL/6J mice receiving oral melatonin for a period of 12 months.

**Methods**: 32 C57BL/6J males were divided into control and melatonin groups. The control received saline and ethanol solution and the melatonin group, 50 μl of 10 mg of melatonin/kg/day orally for a period of 12 months. After the experiment, the animals were sacrificed in a concentration chamber of 40% $CO_2$, and the slides were analyzed morphologically and morphologically.

**Results**: The melatonin group revealed higher median density of viable cells ($45 \pm 10.28$ cells/100 $\mu m^2$, 31–73, versus $32 \pm 7.47$ cells/100 $\mu m^2$, 25–48). The median area of the vascular stria was $55.0 \pm 12.27$ cells/100 $\mu m^2$ (38–80) in the control group and $59.0 \pm 16.13$ cells/100 $\mu m^2$ (40–134) in the melatonin group. Morphometric analysis of the spiral ligament reveals a higher median of total viable neurons in melatonin ($41 \pm 7.47$ cells/100 $\mu m^2$, 27–60) than in the control group ($31 \pm 5.68$ cells/100 $\mu m^2$, 21–44).

**Conclusion**: Although melatonin is a potent antioxidant, it does not completely neutralize the occurrence of presbyacusis; however, it may delay the appearance of this condition.

**Keywords:** Hearing loss; Cochlear; Inner ear; Melatonin; Presbyacusis.

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## Smell disorder and aging

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**Objectives**: To investigate the prevalence of smell alterations and their associations in patients over 40 years of age at the Hospital das Clínicas of the Medical School of Marília.

**Methods**: These are preliminary data from some variables of a cross-sectional study, where patients were divided into two groups: one group with patients aged 60 years or older and another with individuals aged 40–59 years. They were submitted to a general questionnaire and upsit olfactory test.

**Results**: There was a predominance of females. In group I, 18 patients (90%) reported normal smell and in group II 32 (88%) did not report changes in smell. However, the test showed a change of 85% in group I and 66.6% in group II. The prevalence risk ratio (RRP) was 2.83 (95% CI 0.6–18), the prevalence rate was 1.29 and the prevalence in this sample was 73.21%. It was observed that 72.22% of group 2 was not diagnosed at some point since the beginning of the COVID-19 pandemic. Anxiety and/or depression and systemic arterial hypertension were the most prevalent comorbidities in groups 1 and 2, respectively. BMI was elevated in 79.16% in group 1 and 77.77% in group 2.

**Discussion**: Despite the predominance of females, the literature shows a higher prevalence of males. The prevalence of olfactory deficiency based on self-assessment is lower than based on olfactory assessment through objective tests. Although the prevalence found in available publications is lower than that found so far in this study – 73.21% – it is important to highlight, however, that the prevalence of olfactory deficiency based on olfactory tests varies between studies, possibly due to differences in the population examined and the type of olfactory test. Recent studies have shown that diabetes, hypertension and obesity have a significantly high prevalence in individuals with olfactory dysfunction.

**Conclusion**: It is necessary to wait for the end of data collection of this research for further information. However, the results found so far are in line with what is evidenced in the international literature. Despite the limitations of the design of this study, but, given the scarcity of knowledge in the national literature and the importance of understanding the prevalence of olfactory deficit and its correlations, this study can bring relevant contributions.

**Keywords**: Olfaction; Smell disorder; Aging; Smell.

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## Otopathogens in the middle ear and nasopharynx of children with otitis acute media recurrent

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**Objective**: The study aimed to describe the microbiology of the middle ear and nasopharynx and to determine the prevalence of *Streptococcus pneumoniae*, *Haemophilus influenzae* and *Moraxella catarrhalis* in a group of children vaccinated with pneumococcal conjugate vaccine (PCV) who were submitted to insertion of ventilator tubes by recurrent acute otitis media.

**Methods**: We analyzed 278 middle ear effusions and 139 nasopharynx samples obtained from 139 children submitted to myringotomy and ventilation tube insertion by recurrent acute otitis media, from June 2017 to June 2021. The age of the children ranged from 6 months to 9 years and 10 months, with a median of 21 months. Patients had no signs of acute otitis media or respiratory tract infection and were not under antibiotic therapy at the time of the procedure. Middle ear effusion aspiration (OMS) was performed by tympanocentesis, using an Alden-Senturia collector and the nasopharynx (NF) sample was collected with swab. Bacteriological studies and multiplex PCR were performed for simultaneous detection of the three pathogens. The direct molecular determination of pneumococcal serotypes was effected by real-time PCR. Statistical analysis performed with chi-square test to verify associations between categorical variables and measures of association force based on prevalence ratios with 95% confidence interval. $p \leq 0.05$ values were considered statistically significant.

**Results**: Vaccination coverage was 77.7% with basic regimen plus booster dose and 22.3% with basic regimen. In OMS, by culture, *H. influenzae* was identified in 27 children (19.4%), *S. pneumoniae* in 7 (5.0%) and *M. catarrhalis* also in 7 (5.0%). PCR detection found *H. influenzae* in 95 (68.3%), *S. pneumoniae* in 52 children (37.4%) and *M. catarrhalis* in 25 (16.5%), an increase of three to seven times in comparison with culture. In NF, culture isolated *H. influenzae* in 28 children (20.1%), *S. pneumoniae* in 29 (20.9%) and *M. catarrhalis* in 12 (8.6%). PCR identified *H. influenzae* in 84 children (60.4%), *S. pneumoniae* in 58 (41.7%) and *M. catarrhalis* in 30 (21.5%), a two to three-fold increase in the detection rate. Pneumococcal serotype 19A was the most common, both in the ears and in the nasopharynx. In the ears, of the 52 children who had pneumococcus, 24 (46.2%) of them had serotype 19A. In the nasopharynx, of the 58 patients who presented pneumococcus, 37 (63.8%) had serotype 19A. Of the 139 children, 53 (38.1%) presented polymicrobial NF samples. Of these, 47 (88.7%) had some of the three otopathogens in the middle ear and 40 of them (75.5%) had *H. influenzae* in the ears, especially when in NF, this was in conjunction with *S. pneumoniae*.

**Conclusion**: The prevalence of bacteria in a group of Brazilian children immunized with pneumococcal conjugate vaccine and who required insertion of ventilation tubes due to recurrent acute otitis media is similar to that reported in other parts of the world after the advent of PCV. *H. influenzae* was the most common ly found germ, both in the nasopharynx and middle ear, and serotype 19A *S. pneumoniae* was the most detected pneumococcus in the nasopharynx and middle ear. Polymicrobial colonization of the nasopharynx was strongly associated with the detection of *H. influenzae* in the middle ear.

**Keywords**: *Haemophilus influenzae*; *M. catarrhalis*, Otitis media; Pneumococcal vaccination; *Streptococcus pneumoniae*.

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## Is the beauty chip associated with the pathology of the larynx and voice?

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**Objective**: To determine the prevalence of laryngeal lesions in the examination of videolaryngostroscopyin scans in singers and actresses using intradermal hormonal implants.

**Design**: Retrospective study of professional singers and actresses who used intradermal hormonal implants and consulted at an otorhinolaryngology outpatient clinic for vocal evaluation.

**Methods**: Review of medical records of professional singers or actresses who consulted at the Otorhinolaryngology outpatient clinic of HUPE between 2017 and 2019. The fundamental frequency was measured in all patients and compared with historical norms, and the prevalence and character of laryngeal alterations identified in videostroroboscopy were independently evaluated by 2 laryngologists and described.

**Results**: Ten actresses and singers who used intradermal hormonal implants were identified. All patients had evidence of Reinke's edema and all had high RSI scores suggestive of possible reflux. Seven patients had vocal fold lesions (5 cysts, 1 vocal nodule and one pseudocyst), The mean fundamental frequency was below the published norms (188 Hz compared to 212 Hz), but these differences were not statistically significant and may be due to vocal fold lesions, reflux or Reinke's edema.

**Conclusion**: A specific impact of hormonal implant chips on fundamental frequency or vocal pathology could not be identified in this study. The findings, however, that all patients presented Reinke's edema and other vocal lesions may suggest that there is a relationship between these implants and vocal pathology.

**Keywords**: Voice; Professional voice; Larynx; Voice quality.

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## Dissociation between vHIT and caloric test: A marker of Menière's disease? – A systematic review

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**Objective**: To analyze through a systematic review and meta-analysis the proportion of patients with Menière's disease who present altered caloric and vHIT tests and to determine the prevalence of dissociation altered caloric test and normal vHIT in the diagnosis of Menière's disease.

**Methods**: The literature search was performed without restriction regarding the publication period on indexed data platforms. Articles evaluating patients with Menière's disease who underwent caloric test and vHIT were included. Two researchers independently conducted the analysis of the articles, promoting the selection and extraction of data, following the recommendations of the PRISMA method. In case of disagreement during the selection process, a third evaluator was included for analysis. After data extraction, the study consisted of two stages. In a first analysis, the objective was to evaluate the prevalence of patients with Menière's disease who presented alterations in caloric and vHIT tests alone. On the other hand, in a second moment, the objective was to evaluate the prevalence of the combination of results of these two tests, through the combination of 04 groups: (1) caloric test and normal vHIT; (2) altered caloric test and normal vHIT; (3) calic and vHIT test altered; (4) normal caloric proof and altered vHIT.

**Results**: We included 12 articles from a total of 427 initially selected studies, published between 2014 and 2021, with a total of 708 patients evaluated and mean age of 52.72 years. The prevalence of patients with Menière's disease with altered caloric test was 64% (95% CI = 57–71%), while the prevalence of altered vHIT was only 28% (95%CI = 16–40%). The prevalence of altered caloric test dissociation + normal vHIT was 47% (95% CI = 37–57%).

**Discussion**: The dissociation of results in the caloric and vHIT test may be justified by the anatomophysiology of the ampolar crest, since the type II hair cells, with peripheral location, are responsible for low frequency stimuli and acceleration and are selectively affected in patients with Menière's disease. Thus, it is possible that Menière's disease causes an impairment in the vestibular apparatus responsible for processing low frequency responses.

**Conclusion**: The head-impulse test video and the caloric test consist of valuable tools for vestibular evaluation. The dissociation of findings between these two tests in patients with Menière's disease was more prevalent in this meta-analysis and may be the result of tonotopia of ciliary cells specialized in the ampolar crest, providing a possibility for the diagnosis of patients with this otoneurological condition.

**Keywords**: Menière's disease; Caloric test; Head-impulse test video; Ocular vestibule reflex.

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## Anatomic and radiological study of the uncinate process: A paradigm break

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**Objective**: To radiologically determine the anatomical variations of the upper region of the uncinate process.

**Methods**: This is a cross-sectional study in which the research subjects are skulls. Computed tomography (CT) of the paranasal sinus of each skull were obtained. And, after that, the different sites of anatomical correlation of the upper region of the bilaterally uncinated process from anterior to posterior were analyzed in the coronal plane.

**Results**: When analyzing computed tomography, the PU presented fixations on the papyracea lamina, middle turbinate, skull base and interfrontal septum. It was observed that the orbit was the place where the upper fixation was most common. When analyzing the number of fixations on each side, the skulls presented from a single fixation to five simultaneous fixations on the same side.

**Discussion**: PU is the most important and constant milestone in the osteomeatal complex of the middle meatus, which is the key area for functional endoscopic surgery of the paranasal sinus. And among the bone structures that delimit the recess of the frontal sinus, the upper fixation of the PU is the most important. The classification of the upper PU fixation originally suggested by Stammberger and Hawke, who evaluated TCs with thick cuts, described 3 possible upper fixations, considering that pu is included in a single point. The uncinate process is part of the ethmoid bone and, therefore, there is no insertion in the ethmoid bone, but rather variation of anatomical presentation and its relationships with other structures of the ethmoid itself. Thus, pu can be related to the papyaceal lamina, middle turbinat and anterior skull base, in addition to others already described.

**Conclusion**: The uncinated process is part of the ethmoid bone and there are multiple variations of the anatomy of its upper region in the ethmoid bone itself and, therefore, there is no applicability in classifying them.

**Keywords**: Paranasal sinuses; Uncinate process; Anatomy; Radiology; Sinsitis.

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## Changes on cognitive performance after cochlear implantation in adults and older adults: A systematic review and meta-analysis

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**Objectives**: To critically assess the status of the literature on cognitive outcomes after cochlear implantation in adults and older adults.

**Design and methods**: Studies were identified by searching PubMed/Medline, Scopus, Lilacs, Web of Science, Livivo, Cochrane Library, Embase, Psycinfo, and gray literature. No restrictions were imposed regarding language, publication date, or publication status. The studies design included were randomized clinical trials, non-randomized clinical trials, quasi-experimental and cohort studies. Eligibility criteria were as follows: (1) the study sample included adults aged 18 or over with severe to profound bilateral hearing loss, (2) the participants received a multi-electrode cochlear implant, and (3) a cognitive test was performed before and after implantation. Risk of bias was assessed using the ROB, ROBINS-I and MASTARI tools (Joana Briggs Institute), depending on the type of study. Meta-analyses of random effects were performed for the outcomes of interest. The level of evidence was assessed using the Grading of Recommendations Assessment, Development and Evaluation (GRADE).

**Study sample**: Out of 1830 retrieved records, 16 were found eligible (11 non-randomized clinical trials, 3 randomized clinical trials and 2 cohort studies).

**Results**: In the AlaCog test, with the overall effect improvement after 6–12 months postoperatively [MD = −46.64; 95% CI = −69.96 – −23.33; I2 = 71%]. Although the global effect demonstrates statistical significance, the Flanker, Recall, Trail A and n-back test domains did not show statistical significance ($p > 0.05$). For the MMSE, a subgroup analysis was performed, based on postoperative time, but there was no statistical significance in any of the times evaluated [MD 0.63; 95% CI = −2.19 – 3.45; I2 = 88%]. For the TMT test, the analysis was subdivided based on the postoperative period, presenting a significant global effect, with a decrease of approximately 9 s in the processing speed in the postoperative period [MD = −9.43; 95% CI = −15.42 – −3.44; I2 = 0%].

**Conclusion**: Hearing loss rehabilitation with cochlear implants may provide positive impacts on cognitive domains. Well-designed studies with longer follow-up periods are necessary to verify whether cochlear implantation influences cognition positively in older adults along the time. Development of new cognitive assessment tools in hearing-impaired individuals is stimulated.

**Keywords:** Cochlear implantation; Cognition; Older adults; Adults; Systematic review; Cognitive outcomes; Cognitive assessment; Profound hearing loss; Cochlear implant.

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## Pneumococcal prevalence in the media ear and nasopharynx of children with acute otitis media

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**Objective**: To record the presence *of S. pneumoniae* in middle ear effusion (OMe) and nasopharynx (NF) of children with recurrent acute otitis media (OMAR), documenting and analyzing differences that could be related to the use of two different types of pneumococcal vaccine (PCV10 and PCV13).

**Methods**: We analyzed 278 OM And 139 NF samples obtained from 139 children (ages 6 months and 9 months and 10 months; median of 21 months) submitted to myringotomy and ventilation tube insertion by OMAR, between June 2017 and June 2021. Patients had no signs of acute otitis media

or respiratory tract infection and were not under antibiotic therapy at the time of the procedure. The aspiration of the OMS was performed by tympanocentesis, using an Alden-Senturia collector and the NF sample was collected with swab. Bacteriological studies were initiated less than 45 min after obtaining the material and a part of the sample was stored at −20 °C for further PCR analysis. Direct molecular determination of pneumococcal serotypes was performed by real-time PCR. Statistical analysis performed with the Mann–Whitney (numerical variables) and chi-square or exact Fisher tests (categorical variables) and measure of association of prevalence ratio together with 95% confidence interval and significance level of 5%.

**Results**: Vaccination coverage was 77.7% with basic regimen plus booster dose and 22.3% with basic regimen. In OM, *S. pneumoniae was* cultured in 7 (5%) of the children and detected by PCR in 52 (37.4%) of them, an increase of about 7 times (95% CI: 3.5–15.8). Of the 52 CRP children (+), 30 received PCV10 and 22 received PCV13 ($p = 0.303$). In NF, *S. pneumoniae was* cultured in 29 (20.09%) of the children and detected by PCR in 58 (41.7%) of them, a two-fold increase (95% CI: 1.37–2.92). Of the 58 CRP children (+), 39 received PCV10 and 19 received PCV13 ($p = 0.002$). Pneumococcus of serotype 19A was the most found, both in OMAs (24 of 52 children – 46.1%) and nf (37 of 58 patients – 63.8%). Serotype 19A was more detected in OMe and NF of children who received PCV10 ($p = 0.040$ and $p = 0.035$, respectively).

**Conclusion**: S. *pneumoniae* remains very prevalent in NF and in the middle ear of children who develop otitis media. In a group of Brazilian children with OMAR, there was no significant difference in the pneumococcal rates found in the OMOs of children vaccinated with PCV10 or PCV13, but the NF of those vaccinated with PCV13 had significantly less pneumococcus. Serotype 19A was the most prevalent in both NF and OMOs, confirming its importance as colonizer and cause of pneumococcal disease, although its prevalence was significantly lower, both in NF and in OMOs of children vaccinated with PCV13, when compared with those immunized with PCV10. CRP increased, between two and seven times, the possibility of germ detection when compared to the cultural examination. The analysis of the distribution of pneumococci and their serotypes in different countries can contribute to continuously estimate the impact of PCV and the possible need to modify and improve them.

**Keywords:** *Haemophilus influenzae*; Middle ear; Otitis media; Pneumococcal vaccination; *Streptococcus pneumoniae*.

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## SASA/UNIVALI: Overview of constant production in information systems between 2008 and 2019

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**Objective**: To outline the overview of the production of the Outpatient Hearing Health Service (SASA/UNIVALI) between 2008 and 2019. In addition, it has as its specific objective to update and disseminate epidemiological data in the area, including those of the diagnostic and therapeutic procedures of medium and high complexity, constant in DATASUS and compare with the production of Santa Catarina and the states of the southern region (Paraná and Rio Grande do Sul), considering the parameters obtained in 2011, in a study published by SILVA et al., in which the medium and high complexity of diagnostic procedures performed in Brazilian regions was evaluated, thus evaluating the evolution of PNASA in the Region during this period.

**Methods**: A documentary, evaluative, quantitative research was carried out, with secondary source database (DATASUS), performing a descriptive, comparative statistical analysis, through absolute and relative frequency tables, with the number of diagnostic and therapeutic tests of medium and high complexity in audiology performed in the southern region.

**Results**: Apart from the numbers presented only in the city of Itajaí, which is equivalent to the 52 municipalities served in the SASA, and the numbers presented in the southern region, there is a percentage increase in the amounts of tests requested and performed, both of medium complexity and high complexity, if we compare the years 2008–2019. In Itajaí-SC, the increase in requests for medium complexity exams was approximately 206.28%, based on the year 2008 and the last year evaluated being 2019. There is also an 84% increase in high complexity exams between 2011 and 2019. With the numbers obtained for the State of Santa Catarina, there is also an increase, both in the medium complexity exams, in which it presents an increase of 82.8%, as well as in high complexity exams, with an increase of 59.5%. In the medium complexity exams, 99.6% of the requested tests were performed and 100% of the high complexity tests were performed.

**Discussion**: It is observed that the result of CS is not different from the states: Paraná and Rio Grande do Sul. The medium complexity tests requested in the state of Paraná had an increase of 425% between 2008 and 2019 and an increase of 101.4% in high complexity exams, in addition to the increase of 225.4% in the medium complexity exams that were performed. And in the State of Rio Grande do Sul, an increase in requests for medium complexity exams by 175% and 178% in high complexity exams, in addition to a 176.9% increase in medium complexity exams that were performed in this state.

**Conclusion**: It is concluded that there was an increase in the number of procedures, both in Itajaí-SC, and in the states of the Southern Region (Paraná, Santa Catarina and

Rio Grande do Sul), reflecting the increase in demand and cases of hearing loss in the population over the years. However, the population increase was not proportional to the increase in demand, further reflecting the increase in hearing problems in the population and a transition of the age pyramid (less young and older), evidencing the importance of SASA, both at the municipal and state level, for hearing impairment diagnoses through a multidisciplinary service. Furthermore, it is concluded that the State of Santa Catarina has the necessary structure, according to the Ministry of Health, to meet the demand of one hearing health care unit for every 1.5 million inhabitants. Given that hearing problems in the general population tend to increase, the number of 1.5 million will no longer be ideal for each service. With the increase in demands on hearing health, it will be necessary to reevaluate this number per service and even openings of new services in the state. The requested exams that are approved are performed. However, this number of approved patients is not always the same as new patients that the service can assist. Therefore, the service proved to be efficient, but it cannot be considered effective with services still insufficient to meet all the latent demand.

**Keywords**: Epidemiology; Hearing loss; Deafness; Brazil; Otorhinolaryngology.

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## Analysis of the use of mindfulness meditation as therapy for chronic tinnitus

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**Objectives**: The present work aims to establish a directed view of the impact of the meditative practice of mindfulness on the condition of chronic tinnitus and the relationship of the patient with this condition, seeking to quantify and correlate the access to practice with the indices of improvement and perception of tinnitus at different moments of treatment.

**Methods**: The research methodology was based on the follow-up, through an online platform, of a group of patients recruited from the diagnosis of tinnitus in the city of São João Del Rei (MG), who received the treatment for eight weeks. In this sense, the inclusion criteria were adulthood, diagnosis of chronic, non-rhythmic, subjective, primary cause tinnitus, and absence of concomitant treatment. Mental disability and a history of unstable psychiatric conditions one year before the beginning of the study were adopted as exclusion criteria. The THI (Tinnitus Handicap Inventory) questionnaire was applied, translated into Portuguese, before the beginning of treatment, shortly after the end of treatment, and two months after mindfulness therapy to evaluate the short and long-term consequences of this practice of mindfulness for the tinnitus problem of patients.

**Results**: The THI questionnaire considers the emotional (how much tinnitus is associated with feelings of frustration), functional (how much this condition limits the activities of the individual), and catastrophic (how impotent the patient feels) about tinnitus. Thus, it can be inferred that the higher the final sum of the score, the more the picture impairs the patient's quality of life. Comparing the general impact of the meditative practice on tinnitus from the sum of the points of each participant, there was a decrease in the mean total score of the participants between the pre-protocol moment and immediately after, with a reduction in the mean total score of 11.67 points. In addition, within this same scope of analysis, data homogenization is observed with the reduction of standard deviation (SD) by 7.28 points, from 19.73 to 12.45. When analyzing the means of the total scores between the moments ''immediately after'' and ''2 months after'', there is an increase of this average by 1.67 points, but with a new reduction in SD by 0.36 points, indicating more homogenization of the scores. We also individually analyzed the emotional, functional and catastrophic components, observing a greater homogeneity in the score of the participants in the emotional component.

**Discussion**: In addition to the quantitative change perceived by the score obtained in the THI questionnaire, it was found, from subjective questions asked to the participants, that daily practice came to become reality for some, while others reported performing meditation punctually at sporadic moments. In this context, all participants expressed themselves very positively about their experience with mindfulness meditation. Thus, it turns out that there was an improvement in most different configurations. While some reported better managing their feelings, such as irritation, others said they had changed their relationship with food, reducing compulsive eating behaviors and the issue of tinnitus. Less anxiety and more patience and self-control were also common feedback between responses.

**Conclusion**: Although there was no control group in the study, we observed a significant change in the THI score before and after the protocol application. There is a small worsening score after two months, which may reflect the difficulty in maintaining a usual meditation practice after the end of guided meetings. The subjective perception of patients was very positive, bringing positive expectations that the practice of mindfulness meditation can be an effective tool for tinnitus control. The absence of a control group as well as the small sample size makes it necessary to conduct other studies to real prove the benefits of mindfulness meditation in tinnitus.

**Keywords**: Tinnitus; Mindfulness; Meditation; Quality of life.

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