ORAL PRESENTATIONS:

The Amged El-Hawrani Memorial Prize
Winner 2025- Michael Mather

Nasal immunity across infancy in health and disease

Authors and institutions:
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Introduction
The first years of life are crucial for construction of robust immune memory libraries. As infants are obligate nasal breathers the first point of contact between inhaled pathogens and the adaptive immune system is the nasopharyngeal lymphoid (adenoid) tissue. How this tissue orchestrates responses to immune challenges in this important period remains poorly understood.

Methods
We prospectively profiled adenoid biopsies from children (n=20 children, 241,000 cells) across infancy using multi-omic single cell RNA sequencing, including immune receptor profiling (BCR/TCR). We validated these findings with spatial transcriptomics, multiplexed immunofluorescence and functional assays.

Results
Adaptive immune profiles change considerably between 2-6 years of age. There is rapid expansion then involution of germinal centres, with a corresponding increase in memory B cells as immunity matures. We mapped the transcriptomic cues which regulate this evolution. The immune populations and function in adenoid are distinct from the palatine tonsil, with adenoid providing more innate-like defence. Children with otitis media with effusion (OME) exhibit dysfunctional immunoglobulin A production and impaired B cell memory acquisition. *In silico* analysis has predicted re-purposing existing drugs topically in the nose may help ameliorate these effects.

Conclusion
Our novel single cell atlas of the adenoid has revealed new insights into germinal centre dynamics and immune memory construction in early infancy, which will help in intranasal vaccine development. Furthermore, we have identified differences between adenoid and palatine tonsils in functional immunity. Finally, we have identified specific immunodeficiencies in the adenoids of children with OME. Re-purposing existing agents may lead to future non-surgical treatments for OME.

Word count:
250

The Susanna Leighton Fellowship
Winner 2025- Tom Hampton

A randomised prospective cross-over pilot study of the acceptability and efficacy of frugal bone conduction assistive technology for school-age children with hearing impairment in Malawi

Tom Hampton
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Introduction:
Access to assistive technology for hearing health is said to be only 3% in some low-income settings. This study used a frugal, over-the-counter bone conduction device, and sought to determine the acceptability and efficacy of the device for a paediatric cohort with mixed hearing impairment in schools.

Methods:
In this multicentre, randomized, crossover pilot study, we recruited children 5-16years with previous identified hearing impairment (≥20dBHL). Participants received treatment in two 8-week periods, in which an active bone conduction headset device was compared in school with the same device paired with an inactivated placebo (control). The primary end point was the between-treatment difference in the Digits in Noise (DIN) score, recorded as Speech Reception Threshold (SRT) versus baseline. Secondary end points included quality of life scores and Likert scores for subjective satisfaction with device.

Results:
Of 28 children recruited into the crossover trial, only 20 completed 8 weeks in both active and placebo arms (16 weeks total). The primary outcome of median SRT did not significantly increase versus the children's median baseline score. Secondary outcomes included no significant difference in active group versus placebo. Generic (CHU9D) quality of life scores were not significantly improved but one aspect of the hearing specific (YQOL-DHH) quality of life instrument did improve significantly with active device and after the first visit.

Discussion:
This trial of a frugal over the counter hearing device in a school setting was achievable with exploratory analyses suggesting safety and acceptability but no significant difference in speech recognition scores.

Word count:
249

Enhancing Paediatric Endoscopic Airway Training with a High-Fidelity 3D-printed Simulator

Authors: Miss Wisha Gul, Miss Victoria Carswell, Miss Thushitha Kunanandam

Affiliations: Royal Hospital for Children Glasgow, Greater Glasgow and Clyde NHS Trust

Abstract

Introduction

Paediatric airway endoscopy is a vital skill in otolaryngology but is difficult to master due to variable training exposure, exacerbated by centralisation of services. Simulation can complement traditional training; however, current models are often expensive, ethically constrained, or anatomically inaccurate. This study aimed to evaluate the validity of a novel, in-house 3D-printed paediatric airway simulator.

Methods

We developed a modular simulator using CT-derived anatomy of a 6-month-old infant, with interchangeable inserts representing laryngomalacia, subglottic stenosis, and laryngeal cysts. Validation was conducted at three international paediatric otolaryngology conferences via structured questionnaires and practical assessments. A subgroup of seven trainees performed repeated supraglottoplasty on the laryngomalacia model, with time and skill-scores recorded.

Results

Eighty participants completed validation surveys. The laryngomalacia model scored highly for anatomical realism (median 4.55/5), instrument use (4.64), and usefulness for training (4.79). Tissue feedback scored lower (3.9), with comments referencing lack of recoil and tissue thickness. In the performance subgroup, mean procedure time improved significantly (–7.54s, $p = 0.01$), as did skill scores (+1.25, $p = 0.01$), with junior trainees showing greater gains than seniors. Models for subglottic stenosis and laryngeal cysts also received positive feedback, particularly for realism and teaching value.

Discussion and Conclusion

This study introduces a low-cost, anatomically accurate paediatric airway simulator demonstrating strong face and construct validity across a diverse cohort. It effectively improved performance metrics and was favourably compared to existing models. Its affordability, modularity, and reproducibility position it as a valuable tool for simulation-based paediatric airway training for otolaryngology trainees.

Word count:

242

A novel system to investigate the effect of e-cigarette exposure on middle ear epithelium.

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Affiliations:

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Introduction and Aims:

Otitis media (OM) represents a spectrum of inflammatory conditions of the middle ear. It is associated with a significant impact on a quality of life and is a leading cause of healthcare visits and surgery in children. Exposure to airborne particulate matter in the form of tobacco smoke and environmental pollution increases the risk of OM development and recurrence. Recent dramatic expansion in e-cigarette use presents a largely unexamined source of such exposure. Despite evidence of passive exposure risks, e-cigarettes are more likely to be used indoors and around children due to perceived safety. This study aimed to investigate the effects of e-cigarette vapour on middle ear epithelial cells.

Materials and Methods:

We describe the development and proof of concept use of an *in vitro* exposure system to deliver e-cigarette vapour to middle ear epithelial cultures. Foetal middle ear epithelial cells were cultured at the air–liquid interface and exposed to either a polyethylene glycol/vegetable glycerol (PG/VG) mixture, e-cigarette liquid vapour, or control conditions. Measurements of inflammatory mediators were performed from the apical epithelial fluid.

Results:

We describe the development of our novel vapour exposure chamber including process of design and onward modifications, including 3D printing. We discuss the initial *in vitro* use of this chamber with cultured middle ear epithelial cells, alongside preliminary data.

Conclusions:

We have successfully designed and developed a system to study e-cigarette vapour exposure on middle ear epithelium *in vitro*. This platform enables further research into the effects of other aerosols on the middle ear

Word count:

245

Can Household Foods Save Lives? Testing Common Substances Against Button Battery Injury in the Oesophagus

Authors:

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Introduction
Ingestion of CR2032 button batteries can cause life-threatening oesophageal injury in children within hours. While honey and sucralfate are recommended by guidelines as first-aid measures, they are not always immediately available. This study evaluated whether other readily available household substances could offer similar protection.

Methods:
Forty porcine oesophageal segments were randomly assigned to eight groups (n=5 per group): commercial honey, manuka honey, strawberry jam, Greek yoghurt, golden syrup, peanut butter, Gaviscon Advance, and saliva (control). A CR2032 3V lithium battery was applied to each segment with 2 ml of the test substance. After 2 hours, a blinded assessor recorded necrosis depth, width, pH, and visual tissue damage.

Results:
Tissue damage varied significantly by substance ($p<0.001$ for depth, width, and pH). Saliva (control) showed the most extensive necrosis (mean width: 27.5 mm). Strawberry jam, manuka honey and peanut butter, showed little to no tissue damage. Commercial honey, golden syrup, and Gaviscon Advance offered moderate protection, typically reducing necrosis but with some tissue thinning observed. Greek yoghurt surprisingly exacerbated eschar formation.

Conclusion:
Several common household substances—particularly strawberry jam, manuka honey and peanut butter —significantly reduced button battery-induced oesophageal injury in this ex vivo model. These findings support further investigation of these accessible substances as emergency first-aid interventions in suspected button battery ingestion prior to hospital care, though clinical validation is needed.

Word Count:

221

Melatonin and Super-Sedation Pathways as Alternatives to General Anaesthesia for Paediatric ABR: Our Tertiary Unit Experiences in Birmingham and Oxford

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Introduction
Auditory Brainstem Response (ABR) testing is the gold standard for diagnosing paediatric deafness. Early diagnosis enables timely hearing rehabilitation and improved outcomes. ABR under general anaesthetic (GA) is frequently used but carries risks, delays, and high resource use. Oral sedation is an alternative, though its effectiveness declines beyond age four. At Birmingham Children's Hospital (BCH), dexmedetomidine ('super-sedation') extends sedation age to ten years (1) . At John Radcliffe Hospital (JRH), a melatonin protocol provides a safe option for under six (2). We present experiences from both centres.

Methods
We conducted a prospective review of patients undergoing super-sedation at BCH (Feb 2022–June 2025) and a retrospective review of melatonin-assisted ABR at JRH (July 2018–May 2025). Data included age, sedation method, outcomes, comorbidities, and adverse events.

Results
At BCH, 312 children underwent super-sedation with a 97.7% success rate. Mean age was 3.9 years (0.33–14.6). Average sedation onset was 25 minutes, test duration 72 minutes, and discharge time 42 minutes. At JRH, 33 children received melatonin; 23 (70%) were successful, with a mean age of 3.3 years (1.5–6.5). Eight had previously failed natural sleep ABR but succeeded with melatonin. No adverse events occurred in either cohort.

Conclusion
Alternative ABR-sedation services demonstrated high success rates. Melatonin provides a low-risk, low-resource solution suitable for audiology-led delivery, while super-sedation offers greater reliability and extends feasibility to older children.

Word count:

247

References:

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2. Behrman DB, Bishop JL, Godsell J, et al. Efficacy of melatonin for auditory brainstem response testing in children: A systematic review. *Int J Pediatr Otorhinolaryngol*. 2020;131:109861. doi:10.1016/j.ijporl.2020.109861

Improvements in obstructive sleep apnoea parameters following midfacial advancement surgeries in syndromic craniosynostosis

A Asairinachan, D.Brinkman, C.Saxby, J. Ong, L. Sutton, M. Wyatt, M. Samuels

Introduction:

Craniofacial distraction surgeries are often used to correct midfacial deformities associated with syndromic craniosynostosis. Obstructive sleep apnoea (OSA) often coexists in these syndromes, which include Apert, Crouzon and Pfeiffer syndromes. This study aims to assess the improvement in OSA following surgery.

Methods:

A retrospective study of all patients undergoing monobloc and bipartitian distraction surgery between 2004 - 2025 was performed. Patient demographics, associated syndrome, pre-operative and post-operative sleep study results were compared. Based on Apnoea-Hypopnoea Index (AHI) Scores, OSA was classified as mild for AHI 1-5 events/hour; moderate for AHI 5-10 events/hour and severe for AHI>10. Changes in OSA parameters were analysed using Wilcoxon signed rank test for paired non-parametric data, and t-test for paired parametric data, with p values <0.05 deemed significant.

Results:

Complete data was available in 70 patients. Median patient age was 10 (IQR 3-13) years. Following surgery, there was a significant improvement in overall AHI scores from 7 to 2.3 events/hour (p=0.027). In the group with pre-operative moderate and severe OSA, 73.3% achieved an obstructive AHI of <5 events/hr following surgery. There was an overall significant improvement in Sp02 nadir scores from 87% to 89.5%, p=0.0034. Significant improvements and normalisation of transcutaneous $C0_2$ ($tC0_2$) levels were also seen, with mean $tC0_2$ score reduction from 46.1mmHg to 45.1mmHg (p=0.046) and maximum $tC0_2$ score reduction from 52.7mmHg to 49.9mmHg (p=0.0037).

Conclusion:

Craniofacial distraction surgery is effective at significantly improving multiple measurable parameters of obstructive sleep apnoea

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240

Factors influencing Tracheocutaneous Fistula incident rates following Paediatric Tracheostomies: A Service Evaluation.

Authors: Joint first: Mr. Daniyal Sithawalla & Ms. Sarah Akbar. Mrs. Christine English. Ms. Jaya Nichani.

Institution: Royal Manchester Children's Hospital, Manchester.

Introduction:
Paediatric tracheostomy is a procedure performed on children with complex airway pathologies. A tracheocutaneous fistula (TCF) is a known complication that can develop following decannulation of a tracheostomy tube and can result in ongoing distress for patients and their relatives. This study aims to determine the rate of TCF formation post-tracheostomy tube decannulation in children and identify potential risk factors for this complication.

Methods:
A retrospective cohort study was carried out at the Royal Manchester Children's Hospital. All patients undergoing surgical tracheostomies and decannulation process from 2016 to 2024 were identified from electronic patient records. Independent variables comprised patient age at the time of tracheostomy insertion, type of skin incision, indication for tracheostomy and requirement of ventilatory support. The dependent variable was the presence of TCF formation 6 months post-tracheostomy tube decannulation. A multivariable logistic regression model was used for statistical analysis.

Results:
64.1% of patients who met the inclusion criteria developed a TCF. Multivariable regression showed that a younger age at insertion of tracheostomy tube was a statistically significant predictor of TCF formation (p= 0.037). Univariate analysis showed longer cannulation duration was significantly associated with TCF incidence (p = 0.0287).

Conclusion:
Paediatric patients undergoing surgical tracheostomy at a younger age, particularly below 12 months, is identified as a statistically significant risk factor for TCF formation. An awareness of these findings ought to highlight the increased risk and potential consequences of such complications in younger patients, aid counselling, consent processes, guide age-specific follow-up and improve holistic patient-centered care as a result.

Word Count:
248

Tympanometric measurement of ear canal volume in children with trisomy 21: rate of growth and predictive value for success of ventilation tube insertion

Authors: Sam Plyming, Haytham Kubba

Introduction– This study aimed to determine the relationship between ear canal volume in Down's syndrome and the success of insertion of ventilation tubes. We aimed to determine if the ear canal volume could be used as a predictive value of success of insertion of ventilation tubes.

Methods:

We conducted a retrospective study on 50 children with trisomy 21 in order to calculate the growth rate of ear canals. We cross-referenced the operating theatre database with attendees to the trisomy 21 clinic to determine those who have had ventilation tube insertion attempts. Failure was defined as when a ventilation tube could not be inserted. A one-tailed t-test was used to determine if ear canal volume was statistically different in insertion failure compared to the successes.

Results:

Surgical failure occurred in 7 out of 83 cases (8.43%), significantly higher than in the population without trisomy 21 ($p<0.01$). Within the sample of ventilation tube insertions with trisomy 21, the group of failures had a lower ear canal volume ($p=0.036$). No association was shown with the age of insertion attempt ($p=0.33$). There were no failures with volumes >0.51ml.

Conclusion:

Lower ear canal volumes are predictive of an increased failure rate of ventilation tube insertion. We also showed that ear canal volumes grow over time but at a slow rate. Ear canal volume should be used to help surgeons determine the risk of insertion failure as well as counsel patients and families around the risks of surgical failure and consideration of other management options.

Word count:

250

ROLL THE DISE: A UK DISE (DRUG INDUCED SLEEP ENDOSCOPY) MULTICENTRE EXPERIENCE

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Introduction:

To describe and review drug-induced sleep endoscopy (DISE) practices, indications, and outcomes across three tertiary UK paediatric centres, including the influence of weight and body mass index (BMI).

Methods:

A retrospective analysis of DISE procedures performed at three UK centres (Sheffield Children's Hospital NHS Foundation Trust, Imperial College Healthcare NHS Trust, and Cambridge University Hospitals NHS Foundation Trust) was conducted to elicit patient demographics, BMI, indications, DISE findings, and outcomes.

Results:

139 patients (86 male, 53 females; median age 5.7 years) underwent DISE. Median BMI percentile was 75th (range: 5th–99th), with 29% overweight or obese. Common indications included persistent obstructive sleep apnoea (OSA) after surgery (41%), complex medical history (28%), and inconsistent examination findings (22%). Frequent obstruction sites were the tongue base (62%), adenoids (54%), and velum (48%), with multilevel obstruction observed in 68%. Overweight/obese patients had a higher prevalence of tongue base obstruction (78%) compared to non-overweight patients (55%). DISE findings led to management changes in 76% of cases, with common procedures being adenotonsillectomy (38%), tongue base reduction (22%), and supraglottoplasty (18%). Post-operative sleep studies showed improvement in 72% of patients with available data.

Conclusions:

This multicentre UK experience demonstrates that DISE is a valuable tool for identifying multilevel airway obstruction in paediatric OSA, particularly in complex cases or those with persistent symptoms following surgery. Obesity was associated with a higher prevalence of tongue-based obstruction, emphasizing the importance of individualized surgical planning based on DISE findings. The improvement observed in patients aligned with the post-operative sleep studies.

Word Count:

250