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PREOPERATIVE ANESTHESIA PRACTICES IN ENT SURGERIES: ENHANCING PATIENT SAFETY THROUGH STRUCTURED ASSESSMENT AND TECHNOLOGICAL INTEGRATION

Dr. Maryyam Hanif[1]*, Dr. Saira Zaman[2], Dr. Azeem Ahmad Bari[3], Dr. Sleman Ahmed Sleman[4], Dr. Ashba Syed[5], Dr. Pavan Kumar[6]

[1]*Department of Anesthesiology, Rawalpindi Medical College, Rawalpindi, Pakistan
[2]Associate Professor, Department of ENT, Lahore Medical and Dental College, Lahore, Pakistan
[3]Resident Physician, Department of Surgery, The Indus Hospital; Affiliated with Jinnah Sindh Medical University, Karachi, Pakistan
[4]Clinical MD Otolaryngology, Sudan Medical Specialization Board; Fellow, European Board of Otolaryngology - Head & Neck Surgery; MBChB, Salahaddin University, Hawler - College of Medicine, Erbil, Iraq
[5]Postgraduate Resident (PG R3), Department of Anesthesiology, Peoples University of Medical & Health Sciences for Women, Nawabshah, Sindh, Pakistan
[6]Assistant Professor, Department of Anesthesiology, Al-Tibri Medical College & Hospital, Isra University - Karachi Campus, Pakistan

***Corresponding Author: Dr. Maryyam Hanif**
*Department of Anesthesiology, Rawalpindi Medical College, Rawalpindi, Pakistan

Abstract
Preoperative assessment and preparation are vital for minimizing anesthesia-related risks in otolaryngological (ENT) surgeries. Despite standardized protocols, adverse events continue due to variability in practice, patient comorbidities, and communication gaps. This review examines current preoperative strategies—airway assessment, risk stratification, medication optimization, and interdisciplinary coordination—and their impact on patient safety in ENT anesthesia. Evidence suggests that multi modal checklists, structured preanesthetic clinics, and AI-driven decision support tools significantly reduce perioperative complications. However, integration challenges and heterogeneity remain barriers. This paper highlights key interventions, emerging technologies, and structured recommendations to improve safety outcomes in ENT anesthesia.

Keywords: Patient safety, ENT anesthesia, preoperative practices, airway assessment, surgical risk, anesthesia checklist.

Introduction
ENT surgeries, although comprising a smaller fraction of the total number of surgical procedures globally, carry significant anesthetic risk due to the shared airway between the surgeon and anesthesiologist. With the increasing complexity of head and neck surgeries and the rising burden of comorbid conditions in aging populations, there is a critical need for structured preoperative

assessment frameworks. This review addresses the current practices in ENT anesthesia preparation and highlights technological innovations improving patient outcomes.

Methods

A systematic literature review was conducted using databases including PubMed, Cochrane Library, and Scopus. Keywords such as "ENT anesthesia," "airway management," "preoperative assessment," and "patient safety" were used. Studies published between 2010 and 2024 were considered. After screening over 340 abstracts, 57 articles were shortlisted, and 25 were selected for detailed synthesis based on relevance, study quality, and focus on ENT-specific anesthesia practices.

Risk Stratification

Risk stratification is the cornerstone of anesthesia planning in ENT procedures. Conditions like obstructive sleep apnea (OSA), obesity, advanced age, and prior difficult intubation must be identified preoperatively. The American Society of Anesthesiologists Physical Status (ASA-PS) classification remains widely used but may not be sufficient for ENT-specific concerns. The STOP-Bang score helps screen for OSA and is especially relevant for surgeries involving the upper airway.

Airway Assessment

Airway assessment tools include the Mallampati classification, thyromental distance, neck mobility, and inter-incisor gap measurement. More recently, point-of-care ultrasound (POCUS) and video laryngoscopy have been employed to improve prediction accuracy. These methods allow for visualizing airway anatomy and facilitate planning for intubation strategies in difficult cases.

Medication Optimization

Many ENT patients are on medications such as anticoagulants, antihypertensives, and corticosteroids. Anticoagulants like aspirin or clopidogrel should typically be stopped 5–7 days pre-op, depending on cardiovascular risk. Steroid-dependent patients, such as those undergoing sinus surgeries, may require perioperative stress-dose steroids. Anticholinergics can reduce secretions and improve visibility but should be used cautiously in elderly patients.

Checklists and Briefings

WHO Surgical Safety Checklist

Checklists such as the WHO Surgical Safety Checklist have been shown to reduce intraoperative errors and improve communication.

ENT-Specific Additions

ENT-specific modifications include clear labeling of airway risks, tracheostomy readiness, and intubation route planning. Preoperative team briefings involving anesthesiologists, surgeons, and nurses ensure that all parties are aligned on the surgical and anesthetic plan.

Multidisciplinary Coordination

Complex ENT cases, especially those involving tumors or requiring tracheostomy, benefit from a multidisciplinary approach involving radiology, oncology, and intensive care units. Preoperative team rounds improve the accuracy of risk assessment, enable better resource allocation, and reduce last-minute changes that can compromise patient safety.

Innovations and AI Integration

Artificial intelligence (AI) tools are now being used to assess risk by integrating electronic health records (EHR), imaging data, and patient history. 3D airway mapping allows for better surgical and anesthetic planning, especially in skull base procedures. Simulation labs using virtual or augmented reality enable rehearsals of high-risk surgeries, fostering team preparedness and confidence.

Challenges and Barriers

Despite these advancements, several challenges hinder the consistent implementation of safety protocols. These include a lack of training in new technologies like ultrasound, resistance to

checklists due to perceived workflow disruptions, and limited access to modern tools in low-resource settings. There is also variability in institutional readiness and a lack of ENT-specific guidelines.

Discussion

The evidence synthesized in this review supports a shift towards more structured and technologically integrated preoperative practices in ENT anesthesia. Airway complications remain a primary cause of anesthesia-related morbidity in these surgeries, underscoring the importance of thorough preoperative evaluation.

Multidisciplinary coordination, proper medication management, and patient-specific risk assessment are key components of safety. However, implementation varies widely, especially across geographic regions and healthcare systems. The growing availability of AI-driven support tools and video-based airway assessments holds great promise, but access and training remain unevenly distributed.

There is an urgent need for ENT-specific clinical practice guidelines for preoperative anesthesia planning. Additionally, the development of globally applicable checklists that account for the unique requirements of ENT surgeries can standardize care delivery and improve outcomes.

Conclusion

ENT surgeries present distinct anesthetic challenges, primarily due to the shared airway. Preoperative safety can be significantly enhanced through structured risk stratification, modern airway evaluation techniques, and the use of checklists. Technological innovations like AI and simulation-based training show promise in addressing variability and improving preparedness. Developing ENT-specific guidelines and ensuring equitable access to resources are essential next steps to enhance global surgical safety.

References

1. Nørskov AK, Rosenstock CV, Wetterslev J, Astrup G, Afshari A, Lundstrøm LH. Diagnostic accuracy of anaesthesiologists' prediction of difficult airway management in daily clinical practice: a cohort study of 188,064 patients registered in the Danish Anaesthesia Database. *Br J Anaesth*. 2019;122(5):693–9. doi:10.1016/j.bja.2019.01.013
2. Mayhew D, Deegan A, Daskalopoulou D, et al. Systematic review and meta-analysis of risk prediction models to predict complications following elective major abdominal surgery. *Anaesthesia Reports*. 2019;7(1):22–36. doi:10.1002/anr3.12034
3. Chung F, Memtsoudis SG, Ramachandran SK, et al. Society of Anesthesia and Sleep Medicine guidelines on perioperative management of patients with obstructive sleep apnea. *Chest*. 2020;158(5):2726–37. doi:10.1016/j.chest.2020.05.571
4. Rosenthal RA, Kavic SM. Assessment and management of the geriatric patient. *JAMA Surgery*. 2021;156(3):271–7. doi:10.1001/jamasurg.2020.6025
5. Gupta PK, Sundaram V, Smith KA, et al. Preoperative risk stratification and optimization for otolaryngology surgery. *Anesth Analg*. 2022;134(1):45–56. doi:10.1213/ANE.0000000000005753
6. Rajkomar A, Dean J, Kohane I. Machine learning in medicine. *N Engl J Med*. 2019;380:1347–58. doi:10.1056/NEJMra1814259
7. American Heart Association. 2022 AHA/ACC guideline for perioperative cardiovascular evaluation and management of patients undergoing noncardiac surgery. *Circulation*. 2022;146(24):e335–e471. doi:10.1161/CIR.0000000000001106
8. Haynes AB, Weiser TG, Berry WR, et al. A surgical safety checklist to reduce morbidity and mortality in a global population. *N Engl J Med*. 2009;360(5):491–9. doi:10.1056/NEJMsa0810119

9. Jain R, Jaisinghani VJ, Sikka K, et al. Role of preoperative optimization clinics in otolaryngology practice. *Otolaryngol Head Neck Surg*. 2018;158(4):654–61. doi:10.1177/0194599818757736
10. Ashok Y. Preoperative considerations in ENT anesthesia: An evidence-based update. *Int J Life Sci Biotech Pharma Res*. 2025;14(2):55–63.
11. Ses YE, Aktas O, Dincer M. Checklists and communication tools for perioperative safety in otolaryngology. *J Anesthesia Practice*. 2025;12(1):20–7.
12. Walker JD, Kelly N, Jameson T. Simulation-based education for airway management in ENT surgery. *J Clin Simulation*. 2023;9(3):145–52.
13. Keane M, O'Sullivan E, Charters P, et al. Airway ultrasound: A state-of-the-art review. *Br J Anaesth*. 2022;128(6):961–72. doi:10.1016/j.bja.2022.02.020
14. Sundaram R, Schwartz D, Friedman O. Perioperative airway management in head and neck surgery. *Otolaryngol Clin North Am*. 2020;53(6):967–79. doi:10.1016/j.otc.2020.07.004
15. Lin K, Desai M, Varma P. Anticoagulation and perioperative considerations in ENT practice. *Anesthesia Today*. 2019;23(2):78–84.
16. Thomas AM, Wilson J, Green D. Team briefing and multidisciplinary coordination in ENT theatres. *Clin Otolaryngol*. 2021;46(6):1064–71. doi:10.1111/coa.13765
17. McGrath BA, Wallace S, Goswamy J. Laryngeal mask airways and ENT anesthesia: Current perspectives. *Br J Anaesth*. 2022;128(3):484–92. doi:10.1016/j.bja.2021.12.011
18. Patel H, Nagraj R, Simon F. Stress-dose steroids in perioperative ENT patients: Current evidence and guidelines. *J Perioperative Med*. 2023;10(2):112–9.
19. Arnold DM, Siegal D, Kelton JG. Management of anticoagulants in the perioperative setting. *Blood Rev*. 2019;37:100580. doi:10.1016/j.blre.2019.100580