OCCS
Onco Critical Care Socieety

A Protocol for the Development of Onco Critical Care Society consensus statement on the Management of the Difficult Airway in Cancer Patients

Developing Body: Onco Critical Care Society (OCCS) Guidelines Committee

OCCS
Onco Critical Care Society

Background:

The management of the difficult airway represents a critical and high-stakes procedure in intensive care. In critically ill oncology patients, this challenge is significantly magnified by a confluence of disease and treatment-related factors.[1] Anatomical distortions from head, neck, or mediastinal tumours, tissue edema from superior vena cava syndrome, mucosal friability and bleeding risk from thrombocytopenia, restricted neck mobility from radiation fibrosis or spinal metastases, and upper airway edema, all contribute to an elevated incidence of difficult and failed airway management.[2,3]

How airway and its management in oncological patients are different from that of non-oncological patients?

The cancer patients frequently have acquired, progressive anatomical distortions and due to tumour mass effect or treatment sequalae.

Upper aerodigestive tract tumours can cause extrinsic compression, intrinsic luminal invasion, or both. This results in a rigid, non-compliant, and friable airway lumen, making visualization and tube passage hazardous and unpredictable.[4] Mediastinal masses, particularly anterior mediastinal masses in lymphomas or thymomas, pose a unique risk of dynamic cardiopulmonary collapse upon induction of anaesthesia or muscle paralysis due to compression of the great vessels.[5]

Prior radiotherapy to the head, neck, or thorax induces tissue fibrosis and tissue edema. This leads to chronic sequelae such as trismus, supraglottic and glottic stenosis, xerostomia, and obliteration of tissue planes, increasing the likelihood of difficult laryngoscopy, failed mask ventilation, and difficult rescue surgical airway access.[6,7] The utility of supra glottic airway as a rescue device can be severely compromised in cases of extrinsic tracheal compression or significant upper airway edema, where an effective seal and adequate ventilation cannot be established.

Surgical interventions, including reconstructions with flaps, further alter anatomical landmarks.

Bone marrow involvement, haematological malignancies, or chemotherapy-induced myelosuppression can cause profound thrombocytopenia and coagulopathy. This dramatically increases the risk of life-threatening airway haemorrhage during instrumentation, as even minor mucosal trauma can cause bleeding that obscures the view increasing the risk of catastrophic hypoxia .[8]

In patients with large neck tumors, post-radiation fibrosis, or prior surgery, performing an emergency front-of-neck airway is exceedingly challenging. The cricothyroid membrane landmarks are often obliterated, the trachea may be deviated or stenotic, and tissues may be fibrotic or hyper vascular.

In non-oncological critical care, successful tracheal intubation typically secures a patent airway to the few inches proximal to the level of the carina. In cancer patients, the primary pathology may be distal to the endotracheal tube tip, rendering conventional intubation inadequate for ensuring effective ventilation and oxygenation.

Extubation in the critically ill cancer patient is also a distinct and hazardous phase of airway management. It requires anticipatory planning, real-time visual assessment and a rescue plan.

To meet this unique challenge, whenever possible, airway management should be guided by a pre-formulated, multidisciplinary plan involving Intensivist, anaesthesiologist, onco surgeon, pulmonologist well versed in managing such situation. At the same time, immediate availability of advanced equipment for example video laryngoscopes, fibreoptic and rigid bronchoscopes, ECMO etc should be ensured.

Despite its paramount importance, there is a notable absence of guidelines specifically addressing the unique pathophysiology, risk stratification, and procedural considerations for airway management in this vulnerable population.[9,10] This gap leads to heterogeneous practice patterns, potentially increasing the risk of complications.

Therefore, this proposed guidelines aim to establish evidence-based, consensus-driven recommendations. This document will provide intensivists, anaesthesiologists, and emergency

physicians with a structured approach for prediction, preparation, and management of the difficult airway in critically ill cancer patients, aiming to standardize care and improve patient safety.

Objectives

1. To develop a comprehensive, clinically actionable guidelines on the management of the difficult airway in cancer patients in the hospital settings.
2. To define "difficult airway" and "high-risk airway" within the specific context of oncologic critical care.
3. To create a standardized, oncology-specific air-way assessment and preparation bundle.
4. To provide detailed recommendations on pharmacologic strategies (induction agents, neuromuscular blockers) considering hemodynamic instability and concurrent therapies.
5. To outline a tiered, oncology-adapted algorithmic approach to airway management, including the role of video laryngoscopy, flexible and rigid bronchoscopy intubation, and front-of-neck access .
6. To address post-intubation management and extubation.

Methodology

Scope of the statement:

The scope will be limited to patients with active hematologic or solid tumour malignancies in ICU, operation theatre, emergency or any other healthcare setting . It will cover both elective and emergency airway management.

Delphi process

OCCS
Onco Critical Care Socieety

This study will be conducted under the aegis of the Onco Critical Care Society. The study protocol will be available at www.oncoccs.com . No funding was received for the conduct or publication of this study.

A steering committee comprising 10 to 12 intensivists, international pulmonologist, anaesthesiologist, emergency physician, head and neck surgeon with recognized expertise in airway management in oncological patients will oversee the project. An independent Delphi methodology expert, who is a member of the steering committee, will supervise the methodological conduct of the process to minimize cognitive and dominance biases. The Delphi expert will independently manage survey administration, anonymized data handling, and response synthesis. The steering committee members will not participate in voting during the Delphi rounds and will not have access to identifiable responses. The Delphi methodology expert will not participate in statement drafting or modification and will be the only individual with access to raw anonymized outputs for administrative purposes.

An international expert panel of 30-40 members will be constituted based on predefined eligibility criteria including demonstrated clinical expertise in oncology, critical care, pulomonology, emergency medicine, head and neck surgery, scholarly contributions (peer-reviewed publications, invited lectures), and leadership roles in the field. E-mail invitations will be sent to selected experts. Participation will be voluntary, and consent will be implied by completion of survey questionnaires. Experts will remain anonymous to one another until completion of the study.

All steering committee and panel members will declare potential conflicts of interest prior to participation. A separate Conflict of Interest (COI) supplementary document containing disclosures from all members will be provided.

The scope of the project will be defined through a structured review of relevant literature. Databases searched, timeframe, search strings, and key terminologies used to develop the first-round questionnaire will be provided in the Supplementary Material. Based on identified evidence gaps, the steering committee will draft initial clinical statements.

Survey questionnaires will be administered electronically (e.g., Google™ Forms or equivalent secure platform) and will include: Seven-point Likert scale statements (1 = strongly disagree; 4 = neutral; 7 = strongly agree), and Multiple-choice questions (MCQs) with predefined options.

A minimum of three Delphi rounds will be conducted. After each round, anonymized aggregate feedback including response distributions and summary statistics will be shared with participants. Statements not achieving consensus will be reviewed and modified by the steering committee within limits that preserve the original intent of the statement. If substantial modification alters the core meaning of a statement, this will be clearly highlighted in subsequent rounds and documented in the supplementary Delphi reports. Complete round-wise questionnaires, response distributions, and statement evolution will be provided as supplementary material. A Delphi process flowchart will depict participation rates, attrition, and outcomes across rounds.

Consensus, stability, and stopping rules

For Likert-scale items, agreement will be defined as scores of 5–7 and disagreement as scores of 1–3. Consensus will be considered achieved when ≥ 75% of experts vote for agreement or disagreement. Median and interquartile range (IQR) will be used to describe central tendency and dispersion. For MCQs, consensus will be defined as ≥ 80% selection of a single option.

Strong consensus (expert opinion unlikely to change with time) will be defined as:

≥ 90% agreement for any MCQ option; or Likert-scale items with a median of 6 or 7 (agreement) or 1 or 2 (disagreement), with ≥ 75% votes in the corresponding range.

Statements achieving consensus but not fulfilling criteria for strong consensus will be categorized as weak consensus (expert opinion that may evolve with time and should be interpreted on a case-by-case basis).

The predefined consensus thresholds are based on commonly accepted standards in Delphi methodology literature, including guidance from Nasa P and colleagues.[11]

Stability of responses will be assessed using the non-parametric chi-square (χ^2) test comparing response distributions between two consecutive rounds. A p value < 0.05 will indicate instability.

The predefined stopping rule requires demonstration of stability across two consecutive rounds, irrespective of whether consensus or divided opinion is observed, and when further modifications are not expected to produce meaningful change in responses. Statements with persistent divided but stable expert opinion will be reported as: “No recommendation can be amade due to divided expert opinion.”

Attrition bias will be assessed by comparing response distributions between rounds and, where feasible, between completers and non-completers. Round-wise response rates will be explicitly reported.

Statistical analysis

Statistical analyses will be performed using Microsoft Office 365 Excel (Microsoft Corp., Redmond, WA, USA) and IBM SPSS Statistics for Windows, Version 26.0 (IBM Corp., Armonk, NY, USA), as appropriate. Median, IQR, and percentage agreement will be reported for Likert-scale items, and percentage agreement for MCQs.

Data management and reporting

During the study, anonymized data will be securely stored by the independent Delphi methodology expert. Upon study completion, anonymized datasets will be retained securely by the first and corresponding authors and made available upon reasonable request, subject to institutional administrative approval.

Clinical practice statements will be derived from statements achieving consensus and stability. Strong consensus statements will use directive language (e.g., "should"), whereas weak consensus statements will use conditional language (e.g., "may"). Identified knowledge gaps and research priorities will be explicitly reported.

The study methodology and results will be reported in accordance with the ACcurate COnsensus Reporting Document.[12]

Manuscript Writing and Review

Steering committee will draft the full position statement, incorporating all accepted recommendations, evidence summaries, and explanatory text. The draft will undergo sequential review:

1. Internal review by the full GDP.
2. All feedback will be collated, discussed by the GDP, and used to prepare the final manuscript.

Planned Timeline

- Months 1-2: Steering group formation, PICO development.
- Months 3and 4: Systematic literature reviews and evidence synthesis.
- Months 5: Drafting of preliminary recommendations in steering groups.
- Month 6: First round of formal consensus voting.

- Month 7: Revision and second voting round (if needed).
- Month 8: Drafting of full guidelines.
- Month 9: Finalization, submission for journal publication, and dissemination planning.

Dissemination and Implementation Plan

The final Position Statement will be:

1. Published in a well circulated, peer-reviewed journal .
2. Presented at the OCCS Annual Congress and other relevant international meetings.
3. Hosted on the OCCS website with accompanying infographics and algorithm summaries.
4. Promoted via social media and critical care news platforms.

Updating Plan

The GDP will recommend a review of the guideline in 5 years, or sooner if pivotal new evidence emerges.

References

1. Kochanek M, Schalk E, von Bergwelt-Baildon M, et al. Management of sepsis in neutropenic cancer patients: 2018 guidelines from the Infectious Diseases Working Party of the German Society of Hematology and Medical Oncology (AGIHO). *Ann Hematol*. 2019;98(5):1051-1069.
2. Heidegger T, Gerig HJ, Ulrich B, Kreienbühl G. Validation of a simple algorithm for tracheal intubation: daily practice is the key to success in emergencies--an analysis of 13,248 intubations. *Anesth Analg*. 2001;92(2):517-522.
3. Mosier JM, Joshi R, Hypes C, Pacheco G, Valenzuela T, Sakles JC. The Physiologically Difficult Airway. *West J Emerg Med*. 2015;16(7):1109-1117.

4. Ahmad I, El-Boghdadly K, Bhagrath R, Hodzovic I, McNarry AF, Mir F, et al. Difficult Airway Society guidelines for awake tracheal intubation (ATI) in adults. Anaesthesia. 2020 Mar;75(3):509-28.

5. Blank RS, de Souza DG. Anesthetic management of patients with an anterior mediastinal mass: continuing professional development. Can J Anaesth. 2011 Jun;58(9):853-9.

6. Chang KE, Kulkarni V, Hsu YT, Kumar R, Huang YL, Chang HC, et al. The impact of head and neck radiotherapy on the difficulty of tracheal intubation and the risk of difficult airway assessment at the time of surgery. J Clin Med. 2021 Dec 16;10(24):5914.

7. Hillel AT, Karatayli-Ozgursoy S, Samad I, Best SR, Bishop JA, Akst LM, et al. Predictors of posterior glottic stenosis: a multi-institutional case-control study. Ann Otol Rhinol Laryngol. 2016 Mar;125(3):257-63.

8. Goto T, Camargo CA, Faridi MK, Yun BJ, Hasegawa K. Thrombocytopenia and in-hospital mortality risk among critically ill patients with cancer: a propensity score-matched analysis. J Crit Care. 2018 Oct;47:178-84.

9. Apfelbaum JL, Hagberg CA, Connis RT, et al. 2022 American Society of Anesthesiologists Practice Guidelines for Management of the Difficult Airway. *Anesthesiology*. 2022;136(1):31-81.

10. De Jong A, Rolle A, Molinari N, et al. Cardiac arrest and mortality related to intubation procedure in critically ill adult patients: a multicenter cohort study. *Crit Care Med*. 2018;46(4):532-539.

11. Nasa P, Jain R, Juneja D. Delphi methodology in healthcare research: How to decide its appropriateness. World J Methodol. 2021 Jul 20;11(4):116-129.

12. Gattrell WT, Logullo P, van Zuuren EJ, Price A, Hughes EL, Blazey P, Winchester CC, Tovey D, Goldman K, Hungin AP, Harrison N. ACCORD (ACcurate COnsensus Reporting Document): A reporting guideline for consensus methods in biomedicine developed via a modified Delphi. PLoS Med. 2024;21:e1004326.