

Airway-related Mortality: A Literature Review and Concept Analysis

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Introduction

- **Airway-related mortality (ARM) is not well-defined** but is nevertheless a possible sequelae from delayed successful airway management
- The cost of ARM legal claims account for ~80% of anesthesia-related claim amounts¹
- The absence of a unified definition of ARM results in poor accuracy in reporting airway-related death; one study found that only 1 in 4 deaths are reported as such.²
- This study aims to:
 - Systematically review the literature to determine characteristics of patients who require airway intervention
 - Describe the concept of ARM with Walker & Avant's concept analysis framework³
 - Propose a new conceptual definition of ARM

Methods

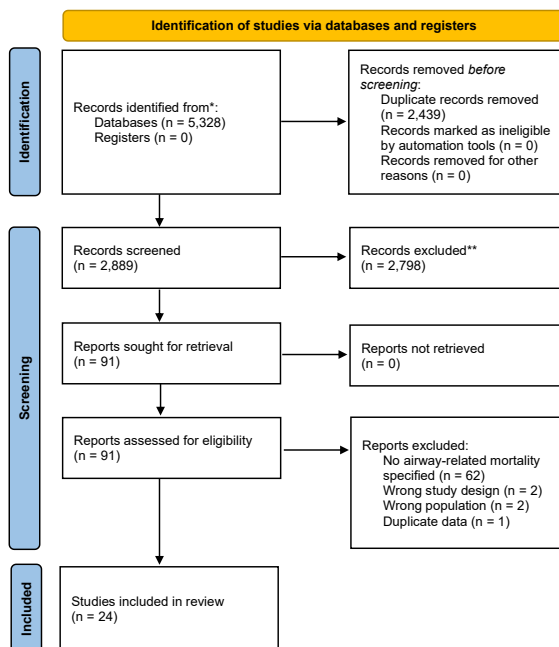
- **A systematic review** following PRISMA guidelines
- MEDLINE, CINAHL, Embase, Scopus and Web of Science databases queried
- **Inclusion:** Individuals requiring airway management, reported incidence of death, reported causes of airway-related death, original research, in English
- **Exclusion:** Simulation/bench science, commentaries, reviews, conference proceedings, or dissertations
- Studies screened & selected, and quality of evidence appraised by two independent reviewers using Cochrane RoB2 and ROBINS-I tools. Data extracted by two independent reviewers
- **Concept analysis** performed with the following steps:

Stage	Description
1	Determining the purpose of the analysis
2	Identifying uses of the concept
3	Determining the defining attributes of the concept
4	Identifying a model case
5	Identifying the borderline, related, and contrary cases
6	Identifying the antecedents and consequences
7	Defining the empirical referents

Results

- Of 5,328 studies, 2,439 duplicates were removed and 2,798 were irrelevant. Of 92 studies that were full-text reviewed, 25 were included
- The proposed operational definition of ARM synthesized from its defining attributes and empirical referents is:

An airway-related mortality is the death of an individual (1) requiring airway intervention due to a current or impending inability to oxygenate and ventilate spontaneously and (2) whose death was primarily caused by an inability to establish a definitive airway with the application of any airway management technique.



- Unclear terminology describing clinical situations, contributing factors, and outcomes was abundant

Antecedents	Consequences	Attributes
Ability to protect airway	Hypoxic respiratory failure	Involves airway
Loss of airway	Hypercarbic respiratory failure	Inability to oxygenate
Attempt to secure airway	Cardiopulmonary arrest	Inability to ventilate
Presence of difficult airway	Neurological injury	Airway management attempted
History of difficult airway	Death	Results in death
	Litigation	
	Psychosocial impact	

Summary and Conclusions

- Difficulty airway protocols, practice guidelines, system approaches, and increased involvement of multidisciplinary teams were commonly employed to prevent ARM
- The lack of consensus on the definition of ARM impeded our ability to abstract the qualities of true airway-related death
- We found a potential for significant discrepancy between the true incidence of ARM and the reported cases, as many methods rely on self-report
- Utilizing this definition in future research is an excellent first step in identifying accurate trends in ARM on a global scale
- Future research is needed to determine the psychosocial consequences of ARM for surviving family members and healthcare providers

References

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