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Airway Management And Airway Clearance For Nursing And Respiratory Therapists And Paramedics

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Abstract:

Background: Airway management and clearance are critical skills for healthcare professionals, including nurses, respiratory therapists, and paramedics, to ensure adequate oxygenation and ventilation in patients. These interventions are vital in diverse settings, from emergency departments to prehospital care, where delays or errors can lead to severe complications.

Aim: This review examines current practices, challenges, and evidence-based strategies in airway management and clearance across nursing, respiratory therapy, and paramedicine. It evaluates skill acquisition, interprofessional collaboration, and the effectiveness of various techniques in different clinical environments.

Methods: A systematic analysis of existing literature was conducted, focusing on airway assessment, basic and advanced techniques (e.g., endotracheal intubation, supraglottic devices), and airway clearance methods (e.g., chest physiotherapy, suctioning). Studies on training effectiveness, simulation-based learning, and interdisciplinary approaches were included.

Results: Findings indicate variability in competency levels among healthcare providers, with paramedics facing challenges in prehospital intubation (first-pass success rates as low as 56%). Nurses demonstrated gaps in airway emergency knowledge, while respiratory therapists excelled in evidence-based airway clearance. Interprofessional training improved outcomes, and supraglottic devices were preferred in prehospital settings for their ease of use.

Conclusion: Effective airway management requires standardized training, simulation-based practice, and interdisciplinary collaboration. Tailored interventions based on patient needs and care settings enhance outcomes. Future research should address training disparities and compare airway clearance techniques for optimal clinical application.

Keywords: Airway management, airway clearance, nursing, respiratory therapy, paramedics, interprofessional collaboration, simulation training.

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Introduction

Airway management and clearance represent essential skills for healthcare professionals such as nurses, respiratory therapists, and paramedics. These practitioners are routinely faced with scenarios that require immediate and competent airway intervention to ensure adequate oxygenation and ventilation. Delays or errors in this area can result in serious patient harm. Their responsibilities often include maintaining airway patency, suctioning secretions, managing artificial airways, and ensuring that patients are ventilated effectively in both routine and critical situations. The complexity of these tasks increases with the urgency and setting in which care is delivered [1][2]. The environments in which these interventions are performed vary significantly and include hospital-based locations like emergency departments and intensive care units, as well as prehospital settings such as ambulance services or field responses during disasters. Each of these contexts presents unique challenges, including limited equipment, time constraints, and the need for rapid clinical judgment. This variability requires that healthcare providers are not only skilled in technical procedures but also competent in assessing the airway, anticipating complications, and initiating appropriate interventions with speed and precision. For nurses, respiratory therapists, and paramedics, achieving competency in airway management demands comprehensive training and continuous practice. Clinical guidelines and protocols guide much of this work, but individual decision-making based on patient condition and situational factors is equally critical. Education and certification programs aim to standardize knowledge across roles, yet the practical application of airway management continues to evolve with advancing technologies and updated evidence-based practices. Current research highlights the necessity of interprofessional training, where collaboration among team members enhances the effectiveness and safety of airway procedures [1].

This review examines current academic literature focused on airway management and clearance practices among the three professions. It critically explores the latest research findings, best practice recommendations, and areas where further evidence is needed. It also considers the overlapping yet distinct roles of nurses, respiratory therapists, and paramedics in ensuring airway patency and preventing complications related to airway obstruction or respiratory failure. By evaluating the current state of evidence, the discussion aims to clarify how each group contributes to airway care and how interdisciplinary approaches can improve patient outcomes. The review places emphasis on skill acquisition, clinical reasoning, and context-specific interventions. In doing so, it seeks to provide a clearer understanding of how airway management protocols are applied across various clinical environments and what competencies are essential for optimal practice. The findings are especially relevant for institutions aiming to strengthen training programs or revise policies to align with the most effective and up-to-date practices [1][2].

Principles of Airway Management

The core of airway management involves assessing, maintaining, and re-establishing airway patency to facilitate adequate ventilation and oxygenation. An open and functional airway is essential for effective gas exchange; any compromise can result in rapid physiological deterioration. Failure to recognize or manage airway obstruction promptly is a significant factor in preventable morbidity and mortality, particularly in emergency and out-of-hospital care settings where delays or mismanagement can have immediate and severe consequences [3].

Airway Assessment

A thorough and prompt airway assessment is the first step in effective airway management. Clinical practice emphasizes the use of standardized algorithms such as the Airway, Breathing, Circulation (ABC) method to ensure a structured and efficient approach. This assessment strategy allows healthcare professionals to prioritize interventions systematically based on life-threatening conditions. Initial assessment typically includes visual examination to detect signs of obstruction, labored breathing, or facial trauma, and auscultation to evaluate air movement and breath sounds. In many cases, especially in critical care and prehospital environments, additional monitoring tools such as capnography and pulse oximetry are used to support clinical judgment. Capnography provides continuous measurement of exhaled carbon dioxide, which helps assess ventilation status, while pulse oximetry monitors oxygen saturation levels. These tools enhance the reliability of assessment and guide decisions related to further interventions [3].

Basic Airway Techniques

Non-invasive airway techniques are foundational to emergency airway management, especially during initial patient contact or in settings lacking advanced equipment. Manual maneuvers such as the head tilt-chin lift and jaw thrust are designed to

alleviate upper airway obstruction, often caused by the tongue falling back against the posterior pharynx in unconscious individuals. These maneuvers are frequently the first actions taken to restore airflow and are effective in many situations where obstruction is positional or soft tissue-related. When manual methods are insufficient, airway adjuncts are introduced to maintain patency. Oropharyngeal airways are commonly used in unconscious patients without a gag reflex to prevent soft tissue collapse and ensure a clear passage for ventilation. Nasopharyngeal airways are better suited for semi-conscious patients or when oropharyngeal access is difficult, as they are less likely to trigger a gag response. These basic techniques are essential components of airway management and are typically within the scope of practice for nurses, respiratory therapists, and paramedics across a variety of clinical and prehospital settings. Their timely application can significantly reduce complications and support effective ventilation until more definitive airway control is established [3].

Advanced Airway Management

Advanced airway management involves techniques beyond basic maneuvers and adjuncts, used when patients are at high risk of airway compromise or when simpler methods fail to ensure adequate ventilation. These procedures demand a higher level of skill, decision-making, and familiarity with complex equipment. Endotracheal intubation remains the most definitive method for securing the airway. It provides a sealed, protected passage for ventilation, significantly reducing the risk of aspiration and allowing precise control over oxygen delivery and ventilation parameters. However, successful intubation requires considerable training, experience, and ongoing competency assessments. Poor technique or delay during intubation can lead to hypoxia, trauma, or failed airway scenarios, especially in emergency settings. As such, it is typically performed by providers with advanced airway certification or under specific clinical supervision. Supraglottic airway devices, including laryngeal mask airways (LMA) and i-gel devices, offer alternative solutions for airway control when endotracheal intubation is not feasible or when time and provider skill levels limit more invasive options. These devices are relatively easier to insert and require less training, making them suitable for use by paramedics, nurses, and respiratory therapists trained in emergency care. In scenarios such as out-of-hospital cardiac arrest or difficult airway access, supraglottic devices serve as effective temporary or backup solutions. They provide a means to oxygenate and ventilate patients quickly while minimizing interruptions in resuscitation efforts [4].

When both non-invasive and endotracheal methods fail or are contraindicated, surgical airway access becomes necessary. Emergency cricothyrotomy is often performed in cases of severe airway obstruction or trauma where conventional methods are not possible. It allows rapid airway access through the cricothyroid membrane and is considered a life-saving intervention when executed correctly. Tracheostomy, though more common in controlled clinical settings like intensive care, may also be employed when long-term airway support is needed or when upper airway obstruction cannot be bypassed using other means. Both techniques require specific training, sterile technique, and awareness of anatomical landmarks to minimize risks. These advanced procedures underscore the need for interdisciplinary training and simulation-based education to prepare healthcare providers for high-stakes scenarios. Proper selection and execution of advanced airway interventions are critical for improving survival and reducing complications in acutely ill or injured patients [4].

Airway Clearance: Concepts and Techniques

Airway clearance focuses on eliminating secretions or physical blockages that hinder airflow and compromise gas exchange. If not addressed, retained secretions can obstruct the airway, reduce ventilation efficiency, and increase the risk of infection. These issues are especially common in individuals with chronic pulmonary diseases such as cystic fibrosis and chronic obstructive pulmonary disease (COPD), as well as in patients experiencing acute respiratory infections or those with neuromuscular impairments that limit effective coughing. Maintaining a clear airway is essential to avoid complications and to enhance the effectiveness of ventilation strategies, particularly in high-risk patient groups [5][6].

Rationale for Airway Clearance

The accumulation of secretions within the respiratory tract can result in a cascade of physiological consequences. Retained mucus contributes to inflammation of the airway lining, which may worsen existing pulmonary conditions or initiate new infectious processes. These secretions can obstruct airflow, interfere with alveolar ventilation, and ultimately impair oxygen and carbon dioxide exchange. Over time, this can contribute to the

development of secondary complications such as atelectasis or lung collapse, especially in bedridden or mechanically ventilated patients. Moreover, for intubated individuals, inadequate airway clearance is a contributing factor to ventilator-associated pneumonia (VAP), a serious and potentially fatal condition. Timely and effective removal of secretions supports better oxygenation and reduces the likelihood of these adverse outcomes [5][6].

Airway Clearance Techniques

A variety of manual and mechanical interventions are used to aid in secretion mobilization and removal. One traditional method is chest physiotherapy, which involves physical maneuvers such as percussion, vibration, and postural drainage. These techniques aim to dislodge mucus from the bronchial walls and shift it toward larger airways, where it can be expectorated or suctioned. This method is often applied in inpatient settings and is especially beneficial in patients with long-standing mucus retention. The Active Cycle of Breathing Techniques (ACBT) represents another approach that integrates controlled breathing, thoracic expansion exercises, and huffing (a type of forced expiration). This method encourages patients to actively participate in their airway clearance and is often used in both hospital and home settings for individuals with chronic respiratory issues. ACBT enhances lung volume and mobilizes secretions without excessive fatigue. Positive Expiratory Pressure (PEP) therapy involves devices that provide resistance during exhalation, generating back pressure that helps keep airways open and facilitates the movement of mucus from distal to proximal airways. PEP devices are commonly used in patients with COPD, cystic fibrosis, or post-surgical conditions affecting lung expansion [7].

High-frequency chest wall oscillation (HFCWO) uses a mechanical vest to deliver rapid, repetitive vibrations to the chest wall. This method helps loosen thick secretions and is particularly useful in patients who cannot tolerate more physically demanding therapies or who require frequent clearance. For patients who are intubated or have tracheostomies, suctioning remains a critical component of airway management. These individuals are often unable to clear their own secretions, making suctioning essential to prevent blockage, maintain oxygenation, and reduce infection risk. The procedure must be performed with appropriate technique and frequency to balance secretion removal with the need to avoid mucosal trauma or hypoxia. Together, these airway clearance techniques form an integral part of respiratory care, improving clinical outcomes in both acute and chronic settings [7].

Nursing: Airway Management and Clearance

Nurses play a key role in the early identification and intervention of airway compromise, especially in acute care and critical settings. As primary bedside providers, they are often the first to assess changes in respiratory status, initiate basic airway interventions, and escalate care when advanced support is needed. Their continuous presence allows for timely monitoring and response to evolving patient conditions, making their contributions essential to safe and effective airway management and clearance [8][9].

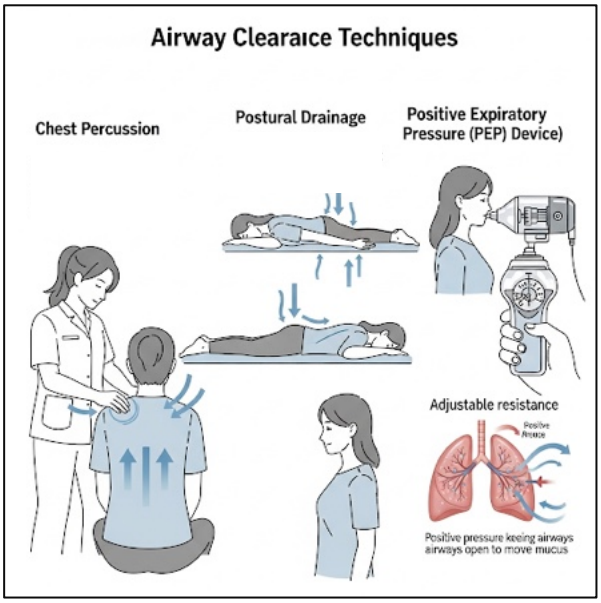

Figure-1: Airway Clearance Techniques.

Knowledge and Competence

Research highlights inconsistent levels of knowledge and skill among nurses when it comes to airway management. Several studies have reported that a significant proportion of emergency department (ED) nurses do not meet the expected standard of competence in managing airway and breathing emergencies. For example, fewer than 50% of surveyed ED nurses demonstrated adequate understanding of airway management principles. Competence in this domain is closely linked to structured education, including simulation-based training and the use of cognitive aids. These training methods improve technical accuracy, confidence, and the ability to make quick decisions under pressure. They also reduce error rates during airway-related interventions. Competency-based training is especially important for nurses in high-acuity

environments, where rapid and effective responses can be the difference between recovery and serious deterioration [10][11].

Airway Clearance in Nursing Practice

Nurses are at the forefront of identifying patients who are at high risk for secretion retention. These include immobile patients, individuals on mechanical ventilation, and those recovering from surgery. Such patients often experience reduced cough effectiveness or impaired mucociliary clearance, increasing the likelihood of airway blockage or infection. Nurses routinely assess these risk factors and implement clearance strategies as part of individualized care plans. In critical care units, airway clearance protocols are frequently nurse-led and integrated into broader respiratory care routines. Critical Care Nurses (CCNs) consistently endorse chest physiotherapy as a standard intervention, particularly for patients receiving mechanical ventilation. This practice is widely recognized as essential for reducing the risk of ventilator-associated pneumonia (VAP). Airway clearance measures, when included in ventilator care bundles, contribute to improved patient outcomes and shortened lengths of stay in intensive care. Nurses ensure adherence to these bundles by performing scheduled interventions, evaluating their effectiveness, and collaborating with multidisciplinary teams [8][7].

Endotracheal Tube (ETT) Care

Following intubation, nurses assume major responsibilities related to the maintenance and safety of the endotracheal tube (ETT). They regularly assess and monitor cuff pressures to maintain a seal without causing mucosal damage. Ensuring that the ETT remains correctly positioned is critical to preventing complications such as accidental extubation, tracheal injury, or aspiration. Nurses also perform routine suctioning of the airway to prevent secretion buildup and monitor the patient's clinical readiness for extubation. Coordination with respiratory therapists is essential during these processes, particularly for ventilator adjustments and the use of adjunct devices. The nursing role in ETT care extends beyond mechanical tasks; it includes ongoing assessment of respiratory function, communication with the care team, and prompt initiation of interventions based on patient response. This integrated approach supports safe airway management and contributes directly to the prevention of airway-related complications [8].

Table-1: Airway Clearance Techniques.

Technique	Indications	Advantages	Limitations
Chest Physiotherapy	COPD, cystic fibrosis	Reduces secretion retention, prevents VAP.	Labor-intensive, requires patient positioning.
PEP Therapy	Chronic mucus retention	Improves expiratory flow, patient-friendly.	Less effective in severe obstruction.
High-Frequency Oscillation (HFCWO)	Neuromuscular weakness	Non-invasive, effective for thick secretions.	Costly, requires specialized equipment.
Suctioning	Intubated/tracheostomy patients	Immediate clearance prevents blockage.	Risk of mucosal trauma, hypoxia.

Respiratory Therapists: Expertise and Airway Clearance Modalities

Respiratory therapists (RTs) play a central role in airway management and pulmonary care, drawing on advanced training that equips them to manage both acute and chronic respiratory conditions. Their scope includes not only routine interventions but also specialized techniques across a wide range of airway clearance and support strategies. In both hospital and prehospital environments, RTs are often called upon for expert input in complex respiratory cases, with their contributions extending from emergency stabilization to long-term care planning [12][13].

Advanced Practice in Airway Management

RTs are proficient in both invasive and non-invasive forms of airway support. They are trained to handle advanced equipment, interpret clinical and ventilator data, and implement interventions based on changing patient needs. Their expertise includes managing mechanical ventilators, adjusting settings to match respiratory mechanics, and troubleshooting alarms or complications. In some regions and clinical settings, RTs are authorized to assist with or perform rapid sequence intubation, a critical emergency procedure that demands technical precision and swift execution. This involvement underlines their role in frontline emergency care, particularly in intensive care units, emergency departments, and transport services. Their presence during high-acuity situations ensures continuous respiratory monitoring and immediate intervention when needed [5][6].

Evidence-Based Airway Clearance

RTs are also at the forefront of applying evidence-based strategies for airway clearance. Findings from systematic reviews and clinical trials indicate that while techniques such as the Active Cycle of Breathing Techniques (ACBT), Positive Expiratory Pressure (PEP) therapy, and High-Frequency Chest Wall Oscillation (HFCWO) all improve secretion mobilization and respiratory function, no single technique consistently outperforms the others across all patient populations. As a result, clinical decisions regarding airway clearance must take into account the patient's underlying condition, current clinical status, comfort with the technique, and response to prior interventions. RTs tailor airway clearance plans based on regular evaluations of patient outcomes such as lung function, oxygen saturation, and subjective symptom relief. These assessments allow RTs to modify or combine techniques to enhance treatment efficacy. For example, in patients with neuromuscular weakness, HFCWO may be supplemented with manually assisted coughing to compensate for ineffective expiratory force. In contrast, patients with cystic fibrosis or bronchiectasis may benefit from more aggressive and frequent airway clearance schedules involving multiple modalities. Beyond implementation, RTs contribute to protocol development and innovation in respiratory care. They often design customized strategies for patients with complex respiratory profiles, ensuring that airway clearance routines are both effective and sustainable. Their work reduces the risk of infection, maintains lung function, and prevents complications such as mucus plugging or respiratory failure. By working collaboratively with nurses and physicians, RTs support integrated care approaches that enhance respiratory outcomes and align with patient-centered goals [5][6][12][13].

Paramedics: Airway Crisis Management in Prehospital Settings

Paramedics operate in unpredictable, time-sensitive environments where airway emergencies must be managed without the full resources of a hospital setting. They are trained to implement both basic and advanced techniques, often under physical, environmental, and emotional stress. Success in prehospital airway management depends not only on technical skill but also on rapid clinical judgment, familiarity with diverse patient presentations, and the ability to adapt protocols to the realities of the field.

Prehospital Airway Management Algorithms

In most prehospital cardiac arrest cases, the initial airway support method is the bag-valve-mask (BVM), which allows for immediate ventilation without advanced equipment. When necessary, care escalates to the use of supraglottic airway devices or endotracheal intubation (ETI), depending on the situation and the provider's training. ETI, while considered a definitive airway technique, presents challenges in prehospital care due to limited visibility, patient positioning difficulties, and lack of backup personnel. Studies show that first-pass success rates for ETI in prehospital scenarios can be as low as 56% in simulations of difficult airways, reflecting the procedural complexity under field conditions. This has led to increased emphasis on preparation, use of alternative devices, and clearly defined fallback plans to ensure that airway patency is secured quickly and safely. Backup options such as supraglottic airways or emergency cricothyrotomy must be readily available and used when initial techniques fail [4][14][15][16][17].

Factors Affecting Paramedic Airway Management Success

One of the most significant factors impacting success in paramedic-led airway management is the frequency of clinical practice. Many paramedics have limited opportunities to perform advanced airway procedures in the field, which contributes to skill degradation and raises concerns about patient safety during high-risk interventions. Regular exposure and ongoing training are necessary to maintain proficiency. Despite these challenges, when advanced airway management (AAM) is executed correctly, it has been linked to improved outcomes, including better chest compression fractions and higher rates of return of spontaneous circulation (ROSC) in cardiac

arrest cases. However, current evidence supports the use of supraglottic devices as a viable and often preferable alternative in many prehospital scenarios. These devices are associated with faster insertion times, fewer complications, and greater ease of use under pressure. In the hands of trained paramedics, supraglottic airways offer effective and reliable ventilation, particularly when ETI is not feasible or has failed. The choice between airway strategies must consider patient condition, provider experience, and situational factors such as transport time and scene stability [14] [15].

Airway Clearance in the Field

Effective airway clearance is crucial during emergency response, especially in trauma, cardiac arrest, and altered consciousness cases, where airway obstruction is a frequent and immediate threat. Paramedics rely on suctioning devices to remove blood, vomitus, or secretions that may compromise airflow. They also use manual techniques such as the head-tilt or jaw-thrust maneuvers and adjust patient positioning to optimize airway patency during and after interventions. These basic yet essential actions often determine whether ventilation efforts succeed in the initial minutes of care. Recent studies highlight the importance of structured protocols and targeted training not only for airway insertion but also for continuous airway assessment and clearance throughout the course of transport. Ensuring airway patency is not a one-time event; it requires monitoring and intervention until the patient reaches definitive care. Paramedics must be equipped with the knowledge and tools to maintain airway integrity in dynamic environments, which reinforces the need for regular education, simulation, and skills refreshers as part of standard paramedic practice [16][17][18].

Table-2: Competency and Success Rate of Airway Clearance.

Profession	Key Findings	Success Rates/Challenges
Nurses	Inconsistent knowledge in airway emergencies; <50% met competency standards.	Improved with simulation training (Deng et al., 2021).
Respiratory Therapists	Proficient in advanced techniques (e.g., intubation, ventilator management).	High adherence to evidence-based clearance (Belli et al., 2021).
Paramedics	Low first-pass intubation success (56%); supraglottic devices preferred.	Skill degradation due to infrequent practice (Deakin et al., 2009).

Interprofessional Collaboration and Evidence-Based Practice

Effective airway management and clearance depend on coordinated efforts among healthcare providers. Interprofessional collaboration involving nurses, respiratory therapists, paramedics, and physicians is central to achieving safe, efficient care. Each discipline brings a unique set of skills and perspectives, but shared goals and standardized approaches are necessary to minimize variability and reduce risk. Evidence-based protocols form the foundation for clinical decision-making, ensuring that interventions are aligned with the best available research and adapted to patient-specific factors. The integration of cognitive aids, such as visual checklists and structured algorithms, has been shown to enhance performance and reduce errors during high-stakes airway interventions. Simulation-based training offers practical, realistic environments where teams can rehearse critical procedures, improve communication, and build confidence. These methods support clinical competence across all disciplines and improve team function during actual emergencies. One practical

example of interdisciplinary effectiveness is the use of ventilator care bundles. These bundles typically include airway clearance measures, suctioning schedules, and protocols to prevent ventilator-associated pneumonia (VAP). Their success depends heavily on the coordination between nursing and respiratory therapy teams. Nurses perform routine suctioning and patient positioning, while respiratory therapists manage ventilation settings and evaluate pulmonary status. This collaboration reduces adverse outcomes and demonstrates how team-based strategies enhance care quality in critical care environments [7][10][3].

Future Directions and Research Gaps

Despite advances in technique and protocol development, significant challenges persist in the implementation and consistency of airway care. One major issue is the variation in training and clinical exposure, particularly among paramedics and providers in remote or prehospital settings. This variability can directly affect performance during airway emergencies and reflects a need for standardized, role-specific training that ensures readiness in all care environments. Another gap lies in the limited comparative data on the effectiveness of different airway clearance techniques and devices. While modalities such as ACBT, PEP, and HFCWO are widely used, head-to-head studies have not established a clear hierarchy of effectiveness across patient groups. This limits the ability to generalize interventions and underscores the need for personalized, context-aware strategies. Clinicians must continue to rely on individual assessment, patient response, and professional judgment when selecting the most appropriate methods [7][8].

Additionally, the frequency and intensity of airway clearance interventions remain poorly defined for many patient populations. Longitudinal research is needed to determine optimal treatment schedules, especially in patients with chronic respiratory disease, neurological impairments, or those receiving mechanical ventilation. This research would help develop more precise, evidence-based algorithms tailored to patient risk profiles and clinical settings. Ongoing professional development is also critical. As techniques evolve and clinical demands shift, healthcare providers must engage in regular continuing education. Simulation training, in particular, provides opportunities to practice rarely used but high-risk procedures, such as cricothyrotomy or advanced airway troubleshooting. Expanding access to structured, team-based simulation and updating protocols based on new evidence will support skill retention and improve overall patient safety. Ensuring that nurses, respiratory therapists, and paramedics are fully prepared through targeted education and collaborative practice will remain essential to advancing the quality of airway management and clearance [11][12][13][17].

Conclusion:

Airway management and clearance are shared responsibilities across nursing, respiratory therapy, and paramedicine, each profession contributes essential skills and clinical judgment to ensure effective patient care. Despite ongoing challenges such as inconsistent training, limited practice opportunities in some settings, and variability in protocol adherence, a multidisciplinary approach anchored in evidence-based practice remains critical. Incorporating new technologies and refining clinical guidelines help address existing limitations, but the foundation of progress lies in consistent education, hands-on training, and interprofessional coordination. Effective airway care demands the selection of appropriate techniques—ranging from manual maneuvers to advanced airway devices—based on patient condition, care environment, and available expertise. No single intervention suits every case; successful outcomes depend on accurately assessing risk, applying the correct method, and adjusting care as clinical needs evolve. Maintaining competence in both basic and advanced procedures requires structured simulation, real-time feedback, and regular skill refreshers. Collaboration among nurses, respiratory therapists, and paramedics enhances the precision and timing of airway interventions, reducing the likelihood of complications such as aspiration, hypoxia, or infection. Shared protocols, clear role definitions, and joint training sessions foster coordinated responses in high-stakes situations. Ensuring that teams function cohesively under pressure improves safety and maximizes efficiency. Tailored interventions based on individual patient profiles—not generalized routines—are central to best practice. High-risk groups, such as those with chronic lung disease, neuromuscular weakness, or mechanical ventilation, benefit from personalized clearance strategies that balance clinical effectiveness with patient comfort and safety. Interdisciplinary evaluation and ongoing monitoring ensure these strategies remain effective over time. Ultimately, advancing airway management and clearance across healthcare settings depends on three priorities: closing the gap between research and practice, maintaining

high clinical standards through continuous education, and fostering interprofessional collaboration. By focusing on these areas, healthcare systems can improve outcomes, reduce avoidable complications, and ensure that airway emergencies are managed with speed, skill, and consistency.

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