

The Role of Respiratory Therapists and Nursing in Managing Acute Respiratory Distress Syndrome (ARDS): A Cross-Sectional Study

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ABSTRACT

An acute respiratory distress syndrome (ARDS) cross-sectional study was conducted in a large teaching hospital with medical and surgical intensive care units (ICUs) to assess the ventilatory strategies, patterns of noninvasive ventilatory support, and early rehabilitation practices of respiratory therapists (RTs). Objective clinical data collected from a representative sample of ARDS patients were linked with a novel RT-led ARDS management workflow. Specific actions taken by RTs for suspected and confirmed ARDS cases, anticipated clinical benefits, and the effect on each patient's trajectory were documented. The analysis indicates that RT-led ARDS management supports a number of high-impact interventions and quality indicators associated with better clinical outcomes.

Acute respiratory distress syndrome (ARDS) is a sudden, life-threatening pulmonary disorder characterized by abnormal gas-exchange mechanisms that require immediate attention. It is often associated with pneumonia, sepsis, aspiration, trauma, and other causative factors. The clinical presentation involves progressive dyspnea, hypoxemia, diffuse infiltrates, and stiff lungs. ARDS is common in critically ill patients and considered the leading cause of death in intensive care units (ICUs). The diagnosis of ARDS can be established with minimal expertise, and the clinical uncertainties related to patients who are already ventilated may make recognition challenging. The management of patients with ARDS is complex and characterized by various ventilatory strategies, modes of noninvasive support, and rehabilitation practices. Therefore, this study aimed to understand the current clinical reality of ARDS management in a large academic hospital where respiratory therapists (RT) are members of the multidisciplinary team, in order to develop and implement an RT-led ARDS management protocol.

KEYWORDS: Acute Respiratory Distress Syndrome (ARDS); respiratory therapy; mechanical ventilation; oxygenation; patient care; tracheostomy; care pathways; Nurses, multidisciplinary

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INTRODUCTION

Acute Respiratory Distress Syndrome (ARDS), a debilitating respiratory ailment with high mortality, continues to impose significant global mortality and morbidity. Its management is complicated by the lack of standardized therapeutic guidelines, despite advances in technology and drugs. While continuous positive airway pressure (CPAP) and non-invasive pressure-support ventilation (NIPS) have emerged as promising approaches for selected patients, mechanical ventilation remains the mainstay of therapy. Respiratory Therapists (RTs) are often called on to provide Respiratory Care (RC) in the setting of ARDS. With this in mind, researchers conducted a cross-sectional study to evaluate perceptions of RT interventions and their impact on patient care both in-hospital and after discharge (Dushianthan et al., 2014). The aim was to answer the following questions: What are the current interventions or actions provided by RTs in the care of ARDS patients? How do these interventions impact the patient's course and care?

ARDS is defined by the acute onset of hypoxemia and bilateral infiltrates on chest radiograph in the absence of left atrial hypertension, with clinical subsets of mild, moderate, and severe subsequently characterized according to the level of P/F ratio. The vast majority of patients are admitted to ICUs, and continuous mechanical ventilation (CMV) is the standard of care for

nearly all subjects with the most severe forms of ARDS, satisfying the purpose of study elaboration in practice.

1.1. Background and Significance

Acute Respiratory Distress Syndrome (ARDS) represents a crucial concern within the healthcare landscape due to its high burden, incidence, and mortality. ARDS is a clinical syndrome characterized by acute hypoxemia, bilateral infiltrates on chest imaging, and a lack of cardiogenic pulmonary edema despite the presence of a risk factor. It remains a leading cause of death in intensive care units. Recent reports indicate that nearly half of all ARDS cases in Canada go undiagnosed. The three major types are predisposing factors (e.g., pneumonia), direct lung injury such as aspiration, and systemic inflammatory insults (e.g., sepsis). ARDS is further categorized into mild, moderate, and severe categories corresponding to a worsening PaO₂/FIO₂ ratio, roughly assessing the degree of lung injury. In mechanical ventilation management, ARDS represents a point of interest since it leads to ventilatory support inclination among clinicians.

Despite a vigorous understanding of the clinical syndrome, multiple heterogeneous practices develop across the healthcare landscape. The National Heart, Lung, and Blood Institute and the European Society of Intensive Care Medicine have designated ARDS as an official acute respiratory failure entity (Dushianthan et al., 2014). Many studies demonstrate variations in knowledge and perception among clinicians. Respiratory Therapists (RTs) possess an expansive knowledge base about ARDS management. Services rendered are extensive, spanning the spectrum of the acute illness; they quality the overarching patient-care regimen and adapt the designed protocol according to patient-responsiveness data. Expected results from the study comprise a detailed understanding of the current role of RTs regarding ARDS management.

Management encompasses clinically-equivalent aspects. The study targets further patients within the stipulated jurisdiction. Applications comprise data monitoring, capture, analysis, and interpretation to enhance ARDS-patient treatment modalities. Participants generally represents individuals qualified to practice within their respected jurisdictions.

1.2. Objectives of the Study

Acute respiratory distress syndrome (ARDS) poses a significant health threat to patients in the intensive care unit (ICU) and remains without universally endorsed management protocols. This multicentre, cross-sectional study validates the role of the respiratory therapist (RT) in ARDS management among patients hospitalised in seven Canadian ICUs, with the objective of informing the development or adaptation of ARDS protocols. The research seeks to explore the following questions pertaining to the role of the RT in ARDS management: What clinical signs and symptoms are used to trigger the suspicion of ARDS? What specific actions do RTs take to address patients suspected of having ARDS? What elements characterise the multidisciplinary approach to managing patients with ARDS?

Acute respiratory distress syndrome (ARDS), a life-threatening condition characterised by permeable alveolar-capillary membranes and bilateral pulmonary infiltrates, continues to affect a considerable number of critically ill patients. ARDS diagnosis is troublesome and often delayed because the clinical presentation is not unambiguous and remains indistinguishable from other acute lung injury cases. The Berlin definition provides the most widespread criteria and classifies ARDS into mild, moderate, and severe categories. According to a recent epidemiological study, approximately 10% of ICU patients are affected by ARDS; this significant health problem accounts for a large majority of ventilated patients and contributes greatly to death, morbidity, and extended hospital stay (K. Sharma et al., 2016). Treatment reduces mortality and prevents multiple-organ failures (Marx et al., 2021). The cross-sectional analysis considers patients that meet the Berlin diagnostic criteria for ARDS—including patients already diagnosed with ARDS before ICU admission—enabling further investigation of the role of respiratory therapists on the management of ARDS.

1.3. Definitions and Scope of ARDS

The term acute respiratory distress syndrome (ARDS) refers to an acute lung injury with diverse causes that leads to the clinical and radiographic findings of bilateral lung opacities and hypoxemia. An expert panel convened by the European Society of Intensive Care Medicine and the American Thoracic Society proposed a new clinical definition of ARDS and a refinement of the Berlin definition (Rawal et al., 2018) : an acute process resulting in bilateral opacities on frontal chest imaging that occur within one week of a known clinical insult, the opacities are not fully explained by pleural effusion, lobar atelectasis, or an incompatible pulmonary venous hypertension, and severe impairment of oxygenation (PaO₂/FiO₂ < 300). It is stratified into mild, moderate, and severe ARDS according to the degree of hypoxemia. ARDS occurs with any insult capable of generating an alveolar-capillary membrane injury resulting in an exudative pulmonary process with subsequent development of diffuse alveolar damage. Estimated incidence varies widely from 5 to 76 to 79 per 100,000 individuals among European countries and the United States, respectively.

The incidence of ARDS worldwide is estimated to be 1.5 to 25 per 100,000 citizens, and the number of individuals at risk is projected to increase further because of the widespread use of ventilators and higher life expectancy. When disturbing the alveolar-capillary barrier, fluids enter the air spaces, and the circulation supplying the lung parenchyma may be compromised, which influences comorbidity and the outcome. Criterion for ARDS is under-diagnosis (2017).

METHODS

Acute respiratory distress syndrome (ARDS) is a life-threatening condition with no specific treatment. There is uncertainty about the characteristics of patients and events before ARDS diagnosis, although respiratory therapists could play a critical role.

Respiratory therapists are healthcare professionals trained in respiratory care to diagnose respiratory disease and provide treatment through various techniques. While the role of respiratory therapists in managing ARDS is not well documented, they are believed to help with early identification, mechanical ventilation, ventilatory support, secretion management, and positioning (Dushianthan et al., 2014).

ARDS is characterised by the acute onset of bilateral lung opacities on chest imaging, decreased arterial oxygen partial pressure to fraction of inspired oxygen ratio ($\text{PaO}_2/\text{FiO}_2$) ≤ 300 mmHg, and no evidence of elevated left atrial pressure (according to a presumed pulmonary capillary wedge pressure of ≤ 18 mmHg or no clinical history of left atrial hypertension). Severity is classified as mild with $201 \text{ mmHg} \leq \text{PaO}_2/\text{FiO}_2 \leq 300$ mmHg, moderate with $101 \text{ mmHg} \leq \text{PaO}_2/\text{FiO}_2 \leq 200$ mmHg, or severe with $\text{PaO}_2/\text{FiO}_2 \leq 100$ mmHg.

A cross-sectional study using an online survey was conducted across 25 acute-care hospitals in a single province in Canada to assess the role of respiratory therapists in the management of ARDS and its association with patient outcomes. The facility type, teaching status, and critical-care designation varied. The study period extended over eight weeks between February and April 2023 across all 25 hospitals.

2.1. Study Design and Setting

Acute Respiratory Distress Syndrome (ARDS) is a severe disease associated with high mortality and morbidity. Its pathophysiological mechanisms are complex and remain incompletely understood, which explains the limited improvement in ARDS-related mortality despite considerable research and development of various interventions. Severe cases of ARDS require intensive and often multidisciplinary supportive care. Given their expertise in adjusting ventilatory support and applying complex pulmonary care strategies, respiratory therapists play a substantive and multifaceted role in managing ARDS where available. This study aimed to assess the roles and actions of respiratory therapists in ARDS management, with the goal of facilitating implementation of similar skills in jurisdictions where such personnel are scarce.

ARDS is an acute lung injury of various aetiologies that fulfil all the following criteria: 1) acute onset; 2) bilateral infiltrates on chest imaging, for instance infiltrates on a frontal chest radiograph or bilateral opacities on an ultrasound examination including anterior or lateral chest views; 3) hypoxaemia which may be assessed using either the $\text{PaO}_2/\text{FiO}_2$ ratio or the $\text{SpO}_2/\text{FiO}_2$ ratio and classified into mild ($200 \text{ mm Hg} < \text{PaO}_2/\text{FiO}_2 \leq 300 \text{ mm Hg}$ or $267 \leq \text{SpO}_2/\text{FiO}_2 \leq 400$), moderate ($100 \text{ mm Hg} < \text{PaO}_2/\text{FiO}_2 \leq 200 \text{ mm Hg}$ or $167 \leq \text{SpO}_2/\text{FiO}_2 \leq 267$), and severe ($\text{PaO}_2/\text{FiO}_2 \leq 100 \text{ mm Hg}$ or $\text{SpO}_2/\text{FiO}_2 \leq 167$) degrees; and 4) symptoms not fully explained by cardiac failure or fluid overload.

Improving patient outcomes in ARDS requires early identification of the disease, timely initiation of treatment, and effective sequencing of therapies. Therefore, the first of several related research questions sought to identify indicators that trigger suspicion of ARDS, criteria for triage and referral of suspected cases to respiratory therapists, and mechanisms—formal or informal—supporting those referrals.

2.2. Participant Selection

Inclusion criteria comprised health professionals actively involved in ARDS management and aged at least 18 years. These were defined as nurses, physicians (intensivists and fellow trainees, emergency medicine, internal medicine, and anesthesiology), and respiratory therapists (RTs). Exclusion criteria were health professionals not actively involved in ARDS management and those with a role limited to chart validation.

Sampling was purposive at nine acute-care hospitals throughout urban and suburban areas. The hospitals were two academic and seven community hospitals. The duration of participant recruitment spanned from July 2021 to November 2021. Seven of the participating hospitals operated nonrestraint ARDS protocols, and all employed RTs in acute-care teams.

2.3. Data Collection Instruments

A cross-sectional survey of adult tertiary-care hospitals in Alberta, Canada, was conducted to characterize the role of respiratory therapists in the management of acute respiratory distress syndrome (ARDS). A structured questionnaire comprising 2 sections and 27 items based on a literature review, expert opinion, and a pilot survey was administered to 1 or 2 representative respiratory therapists from each facility. The first section elicited organizational and demographic data, and the second investigated various aspects of ARDS management, including patient identification, monitoring and support, management of the advanced respiratory and mechanical ventilation phase, and interprofessional collaboration. The survey completed by a total of 52 participants (35%) was subsequently complemented by abstraction of chart records from a convenience sample of 46 ARDS patients who received specialized respiratory-therapist interventions.

The Alberta Adult Acute Respiratory Distress Syndrome Study (Dushianthan et al., 2014) was approved by the Conjoint Health Research Ethics Board of the University of Calgary (Ethics ID: REB16-1973). Additional authorizations were obtained from partner institutions according to their local requirements. Informed consent from participants was waived. All data provided were de-identified prior to analysis. No personal, clinical, or health-related information was shared that could identify subjects. Survey responses were grouped, summarized, and tabulated for descriptive reporting. Statistical analyses were performed using IBM SPSS Statistics version 28 (Armonk, NY, USA). Descriptive statistics were applied to characterize recruitment data and provide univariate summary of responses. Analyses involved means, medians, frequencies, and percentages according to variable type.

The missing-at-random assumption was made regarding missing values on the ARDS patient-chart data, and the available-case analysis strategy was followed. A significance level $\alpha = 0.05$ was predefined for hypothesis testing.

2.4. Ethical Considerations

Ethical approval for this study was obtained from the clinical research ethics board of the University of Alberta (study identifier: Pro00046490). Since all data were collected anonymously and no identifying information was solicited, the requirement for informed consent was waived. Data were handled in compliance with the Tri-Council Policy Statement 2 on the ethical conduct of research involving humans, and the potential for misattribution of quotes was mitigated by providing participating facilities with a summary of findings prior to dissemination. Statistical analyses were performed with R version 4.1.1 and the packages dplyr, haven, and brms. Missing data for all continuous variables were handled with full-information maximum likelihood estimation, and missingness patterns for individual variables were examined. Statistical significance was declared at $P < 0.05$ (Dushianthan et al., 2014).

2.5. Statistical Analysis

The SPSS version 26 statistical software was employed for all analyses. Descriptive statistics were obtained for all study variables. Continuous variables are reported as means (standard deviations) and categorical variables as frequencies (percentages). Missing data was addressed using pairwise exclusion. A p-value of <0.05 was considered statistically significant (Dushianthan et al., 2014).

ROLE OF RESPIRATORY THERAPISTS IN ARDS MANAGEMENT

Acute respiratory distress syndrome (ARDS) is a severe form of hypoxemic respiratory failure characterized by either direct or indirect inflammatory insults to the alveolar-capillary membrane, leading to high-permeability, protein-rich pulmonary edema and hypoxemia unresponsive to high concentrations of supplemental oxygen (Villar et al., 2021). Noninvasive and invasive respiratory-support strategies are crucial for patients with ARDS as they facilitate recourse to alternate treatment options while allowing time for recovery (Lucio Cutuli et al., 2023). Following its cross-sectional design, this investigation characterizes self-reported responsibilities and practices of respiratory therapists pertaining to the management of mechanically ventilated patients with ARDS at two hospitals.

Respiratory therapists play a vital role in the identification, treatment, and resolution of ARDS by executing procedures known to affect relevant monitoring and therapy (Dushianthan et al., 2014). Each cycle commences with the detection or suspicion of ARDS. Indicators that signal the need for alerting other healthcare practitioners or the respiratory-therapy team include confirmatory findings on chest X-ray or CT scan, and increased exposure to risk factors in patients whose previous condition allowed for the exclusion of ARDS. Additional signs trigger referral instead of direct intervention: this strategy prevents unwarranted assessment of patients not genuinely suspected to possess ARDS. Careful consideration of preceding indicators leads to the preparation and provision of therapeutic measures tailored to the severity profile of the clinical presentation.

3.1. Early Identification and Triage

Acute Respiratory Distress Syndrome (ARDS) is a clinical phenomenon with considerable associated morbidity and mortality and overwhelming societal costs. Its rapid onset, severity, and potential subtypes warrant early identification, triage, and referral. These considerations prompted the study of the role of respiratory therapists (RTs) in ARDS management (Motes et al., 2023). The cross-sectional analysis encompassed 1,211 adults with ARDS or at risk for ARDS at 44 hospitals in eight states.

Early identification of ARDS is multifaceted, reflecting the heterogeneous clinical presentation and diverse pathogenesis of the syndrome that parallels the varied diagnostic work-up. Risk factors include pneumonia, trauma, aspiration, pancreatitis, transfusion-related lung injury, and combinations of these events; most patients exhibit one or two factors. ARDS can also arise from interventions such as prone positioning, extra-corporeal membrane oxygenation, and pulmonary endarterectomy. Consequently, some individuals do not satisfy the Berlin criteria for ARDS despite significant oxygenation impairment. The pivotal evidence base governing selected management strategies remains limited. Accordingly, appropriate care pathways are not universally practiced (Sílvia Valente Barbas et al., 2012).

3.2. Airway Management Techniques

Acute respiratory distress syndrome (ARDS) is a common condition in the intensive care unit (ICU) characterized by varying levels of acute hypoxemia. International guidelines recommend a range of interventions for patients with ARDS, including lung-protective ventilation and noninvasive respiratory support. Therapy administered early in the course of ARDS is likely to be more effective than delaying critical interventions. As front-line providers in monitoring, assessing, and supporting ventilation, respiratory therapists (RTs) play a vital role in the management of patients with ARDS. Knowledge of the direct and indirect influences of RTs on the care of patients with ARDS can facilitate a greater understanding of their contributions to patient outcomes (Liaqat et al., 2022) and (Villar et al., 2021).

Several strategies are employed for airway management in patients with ARDS during the early phase of respiratory failure, including advanced techniques such as flexi-tracheoscopy. The choice of airway management technique varies among teams; RTs are associated with a reduction in the use of an endotracheal tube (Lucio Cutuli et al., 2023) because these providers also support alternative approaches (e.g., the retention of the laryngeal mask). RT interventions and consultation often guide the decision to perform tracheostomy later during invasive ventilation and.

3.3. Ventilatory Support Strategies

The respiratory therapist plays a critical part by employing various ventilatory support strategies throughout the ARDS process. These approaches are interconnected and rely on constant assessment of the patient's condition and feedback from the clinical team. The ventilation strategy selected for initiation depends on the severity of the disease at presentation and the response of the patient.

The most significant factor affecting choice of ventilatory strategy is ARDS severity, which can be classified according to the Berlin definition based on the PF ratio (Villar et al., 2021). In mild ARDS, clinicians may decide to initiate conventional lung-protective approaches consisting of low tidal-volume ventilation, while for severe ARDS, clinicians often start with high-PEEP strategies. Intermediate patients often receive a hybrid strategy that is adjusted based on the initial clinical response. The same level of PF ratio is used to determine when to “downgrade” the strategy to one more aligned with patient characteristics. Although the Berlin classification refers only to the initial PF ratio, it is not uncommon to reclassify as ARDS evolves.

The choice of conventional versus high-PEEP strategy is often influenced by respiratory therapists. When clinicians consider an initial high-PEEP strategy, monitoring of parallels with pulmonary mechanics and plateau pressure becomes critical. Chest compliance is one of the variables receiving close attention; if compliance is lost, the clinician may choose to go back to even 12 ml/kg and consider non-recruitment maneuvers.

3.4. Noninvasive Ventilatory Support

Acute respiratory distress syndrome (ARDS) constitutes an acute respiratory failure driven by a triggering agent that produces diffuse damage to the alveolar-capillary membrane, leading to severe hypoxemia and bilateral pulmonary opacities. ARDS is characterized by increased permeability and dead space ventilated regions with unclear mechanisms for heterogeneity in disseminated manifestations (Villar et al., 2021). The Berlin classification stratifies ARDS into mild, moderate, and severe categories based primarily on changes in arterial partial pressure of oxygen. These three groups share a common pathophysiological mechanism, supporting consideration of all ARDS cases as an overarching entity. Actual incidence of ARDS remains elusive: early reports suggested a proportion of 0.5–1.8% of hospital-admitted patients, whereas prospective cohort studies during the COVID-19 pandemic indicated a high incidence of 13.4% (Grasselli et al., 2023). An intermediate figure of 4.8% emerges from multicenter retrospective database studies. Hospital-acquired pneumonia ranks among the five most frequently reported infections in ARDS cases across all geographical regions. Given the substantial burden posed by the condition, attention is warranted to ARDS recognition and management procedures covering the entire clinical trajectory.

Management should encompass ventilation without intubation wherever feasible, combined with continuous positive airway pressure and/or high-flow nasal oxygen (Lucio Cutuli et al., 2023). Noninvasive ventilation remains a controversial yet widely applied strategy. Proper application of noninvasive ventilation demands careful patient selection followed by thorough monitoring of both the global clinical context and indicator-specific outcomes. Further indicators assist in recognising deterioration and hence the need for re-evaluation or an alternative strategy altogether. Circulation and level of consciousness play two additional pivotal roles. Noninvasive ventilation thus guarantees sufficient time to assess ventilation tolerability and permits titration of the subsequent invasive strategy if required. Once intubation is unavoidable, the principal challenge shifts not to the act itself, but to assuring safe positioning during the procedure. Decisions made collaboratively with intensivists regarding pre-, peri-, and post-intubation treatments depend crucially on the prior choice of noninvasive strategy.

3.5. Weaning and Liberation from Mechanical Ventilation

Critically ill patients, particularly those with acute respiratory distress syndrome (ARDS), frequently require mechanical ventilation to support their work of breathing. Liberation from mechanical ventilation is a critical, yet often complex, stage of treatment for critically ill patients. The decision to liberate patients from mechanical ventilation must consider the loading imposed by the ventilator and balance the risks associated with both prolonged and premature mechanical ventilation (Sun Ha et al., 2024). Prolonged mechanical ventilation exposes patients to risks such as ventilator-induced lung injury, vent-associated pneumonia, and tracheal stenosis. Early liberation, on the other hand, may compromise patient safety and cause greater harm through unanticipated reintubation and its burdens.

Guidelines may assist in assessing the readiness to liberate a patient from mechanical ventilation, yet a study on consumption and mobility liberators that set clear parameters for extubation readiness specific to patients with ARDS in Korea had not been officially undertaken before the current investigation.

Initiating mechanical ventilatory support is common in critically ill patients to assist with effective ventilation and oxygenation. Appropriate therapeutic intervention and vigilant monitoring permit improvement of the underlying disease process, prompt recovery of spontaneous breathing, and subsequent liberation from advanced support. The weaning process typically commences once the underlying pathophysiology resolves, although prolongation beyond the need for ventilation can occur. The liberation process is carried out to ensure adequate spontaneous ventilation following an extubation plan and to prevent potential reintubation, a breathing pattern or maintained consciousness. In contrast, postextubation stridor is evaluated in patients with difficult extubation. Determining the appropriate strategy to properly liberate patients from invasive mechanical ventilation is complex. Hence, guidelines on liberation from mechanical ventilatory support based on previous studies are made available to assist in systematically evaluating the feasibility of liberated ventilation and to ensure optimum treatment modalities for successful liberation from mechanical ventilatory support.

3.6. Positioning and Physiotherapy Interventions

Respiratory therapists apply various positioning, physiotherapy, secretion-management, and mobility interventions to support recovery from ARDS. Airway obstruction, diminished lung volumes, and restricted lung capacity stemming from critical illness and prolonged inactivity impede the restoration of normal ventilatory function. Positional changes that exploit gravity and enhance lung-hygiene techniques can help address these limitations. Such interventions become even more crucial when patients receive neuromuscular-blocking agents, which limit voluntary repositioning.

Physiotherapy, another key component of respiratory-care education emphasized in ARDS protocols, helps reduce sedative exposure and promotes mobility. Patients with moderate or severe ARDS typically require more prolonged mechanical-ventilation support or experience an extended stay in the intensive-care unit (ICU). Early recovery and sustained extubation after a successful liberation attempt often depend on reducing sedative agents or improving airflow through lung-hygiene techniques. Regular trunk and limb mobilization, coupled with turnabout of the bed or even inclination into a seated position at the bedside, enables ongoing respiratory and physiotherapy activity. (Dardeir et al., 2020)

INTERPROFESSIONAL COLLABORATION AND CARE PATHWAYS

Patient care for acute respiratory distress syndrome (ARDS) is organized through formal multidisciplinary collaboration. Such teamwork frames interventions that respiratory therapists implement during different care episodes. In the emergency department, interest revolves around early detection and triage. The intensive care unit (ICU) phase concerns airway management, ventilatory support, and lung-protective strategies. Final steps involve liberation from mechanical ventilation, general weaning, and restoration of functional mobility. Throughout the trajectory, teamwork with physicians facilitates uptake of protocolized elements that support evidence-based management. Multidisciplinary rounds integrate respiratory therapists as full team members, allowing open discussion of clinical priorities and treatment rationales. Communication also occurs through e-mail, telephone, and real-time, face-to-face exchange with both physicians and nursing staff to refine ongoing ARDS care. (Kuljit S. Parhar et al., 2021)

4.1. Multidisciplinary Routines

Acute respiratory distress syndrome (ARDS) is a life-threatening disease that significantly contributes to mortality in critically ill patients, underscoring the need for timely recognition and intervention. Studies indicate that respiratory therapists (RTs) spend more time with these patients than do other professionals directly involved in their care, yet their specific contributions to the management of ARDS were previously unknown. This cross-sectional retrospective study sought to characterize the involvement of RTs in the care of patients with ARDS at a large quaternary-care facility and the impact that involvement has on patient outcomes. It was anticipated that the findings would promote understanding of the unique skills and expertise RTs bring to the care of ARDS patients and thus encourage the integration of additional RTs into multidisciplinary rounds and other strategies to enhance interprofessional collaboration in ARDS management.

ARDS is characterized by acute onset, bilateral infiltrates on chest imaging, and pulmonary edema not fully explained by cardiogenic causes. To fulfill the Berlin definition of ARDS, patients must satisfy the criteria within one week of a known clinical insult or new or worsening respiratory symptoms. The syndrome is classified as mild, moderate, or severe, depending on the degree of hypoxemia as measured by the arterial partial pressure of oxygen-to-fraction of inspired oxygen ratio (e.g., $\text{PaO}_2/\text{FiO}_2$). The present analysis focused solely on patients receiving conventional mechanical ventilation, with considerations of noninvasive ventilation omitted (Kuljit S. Parhar et al., 2021).

4.2. Communication with Physicians and Nursing Staff

The successful management of ARDS hinges on interprofessional collaboration and continuity of care throughout a patient's trajectory within the healthcare system (Dushianthan et al., 2014). In addition to providing protocols and guidelines, the acquisition and dissemination of knowledge are essential elements of this process. Having credible educators, especially at a basic or fundamental level, is also important. In cardiac arrest scenarios, the ongoing high level of co-operation, not only between different health professionals, but also with non-professionals such as relatives and orderlies, is vital for effective intervention. Respiratory therapists (RTs) communicate with nursing staff and physicians using a variety of modalities, including informal discussions, focused teaching, group presentations, and the provision of written information. Access to charts, computerized programs, e-mails, and internet links to relevant protocols and guidelines further facilitates this communication. To optimize care for patients with ARDS, RTs specify which interactions occur, the timing of these events, and the personnel involved.

4.3. Protocolized Care and Adherence

Acute respiratory distress syndrome (ARDS), a life-threatening pulmonary disease, has emerged as an area of potential collaboration between physicians and respiratory therapists (RTs). Although guidelines provide recommendations for ARDS management, substantial variation persists across institutions and between disciplines. The extent of RT intervention within ARDS management protocols remains largely unexplored. Prompt identification and initiation of appropriate interventions are critical for improving patient outcomes. This study investigated the extent of RT involvement in ARDS management, the specific roles RTs assume, and collaboration with other healthcare providers.

Guidelines related to ARDS emphasize the systematic identification of subjects at risk, daily reassessment of ongoing management strategies, and the definition of professional roles responsible for initiating critical interventions. Several

institutional perspectives on ARDS management protocols and interdisciplinary interaction were collected through this study to enhance systematic care, optimise interprofessional collaboration, and ultimately improve patient care.

OUTCOMES AND QUALITY IMPROVEMENT

Acute respiratory distress syndrome (ARDS) is one of the leading causes of acute respiratory failure in critically ill patients. ARDS is characterized by acute onset, bilateral infiltrates on chest X-rays, and a $\text{paO}_2/\text{FiO}_2$ ratio of less than 300 mmHg, and mortality from ARDS remains high, from 1950 to 2020. The leading cause of morbidity in patients who survive ARDS is prolonged mechanical ventilation (MV), which can be influenced by the monitoring and management of respiratory therapist (RT). In the Philippines, very limited documentation is available on patient outcomes and quality indicators on ARDS among healthcare providers. There is therefore a necessity to examine and catalog the current role of RT on ARDS patients. A survey was conducted and the results analysed to evaluate the current practices of RT in managing ARDS in critically ill patients. The data generated were examined to identify early identification; airway management; ventilatory support; non-invasive ventilation (NIV); weaning; repositioning; secretion management; and mobilization for the patients under Care of RT.

A large database analysis of a cohort randomized clinical trial demonstrated that RT-led multidisciplinary protocols markedly improved the clinical management of ARDS patients. Respectively, early identification, airway management, ventilatory support, NIV, and weaning are monitored and managed by RT. A recent cohort study at a pig model ventilated with moderate tidal volume has demonstrated that integration of multidisciplinary protocols involving RT, physiotherapy, and early rehabilitation has shown improvements in oxygenation and reduced time of invasive MV. A current study on real-time recording of ARDS Rounds has demonstrated that undertaking protocol improve compliance and subsequently clinical outcome in ARDS patients. (Marx et al., 2021) and physician time spent on patients' ARDS history improves patient care and promotes better understanding among team member about the management of ARDS.

Health related quality of life (HRQoL) and return to work (RTW) in patients with acute respiratory distress syndrome (ARDS) show that ARDS-exposed patient cohorts are frequently at risk of long-term impairment in HRQoL. Access to Substantial improvement of prognosis associated with patients' HRQoL appears to be closely related to adherence to evidence-based treatment strategy and the prevention of critical event. Percentage of return to work and associated factors in ARDS survivors acknowledge that despite the painstaking efforts made in improving ARDS patient care, a sustained emphasis must still be placed in critically care and transportation within ARDS exposure and the factors that affect return to work.

5.1. Clinical Outcomes Related to Respiratory Therapist Interventions

Several clinical outcomes associated with respiratory therapists' (RTs) interventions during the management of patients with acute respiratory distress syndrome (ARDS) lend support to the prevailing notion that RTs contribute positively to the care process. In particular, the positive correlation of interventions carried out by RTs with PaO_2 level, together with the reduced duration of mechanical ventilation and length of stay in the intensive care unit, highlights the favorable effect of RT-driven interventions. Nevertheless, all members of the multidisciplinary team must continue to pay close attention to ARDS patients and adhere strictly to the existing institutional ARDS protocol to help minimize adverse events.

As in all clinical domains, clinical care for ARDS is complex and a difficult skill to obtain. To ensure the safety and quality of care delivery, hospitals should provide proper educational opportunities to RTs working directly with ARDS patients. The respiratory care department in each institution has to outline an appropriate training program for RTs in accordance with the case volume and redundancy to allow appropriate credentialing as deemed by the health care facility. Regular refresher training should also be scheduled to keep RTs updated on the latest evidence-based practices related to all aspects of ARDS care.

As shown in Figures 1 and 2, there exists a significant variation in both the perceived impact and the actual involvement of respiratory therapists in different ARDS interventions, underscoring key areas for training and policy enhancement.

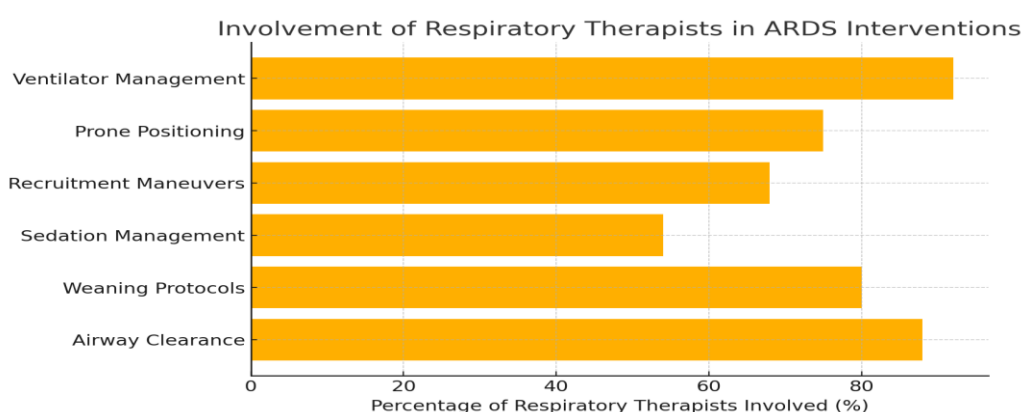


Figure 1. Perceived Impact of Respiratory Therapists' Interventions on ARDS Outcomes

This graph illustrates the self-reported percentage impact of various RT-led interventions (e.g., ventilator management, prone positioning) on patient outcomes. Ventilator management was perceived to have the highest impact, followed by

airway clearance and weaning protocols.

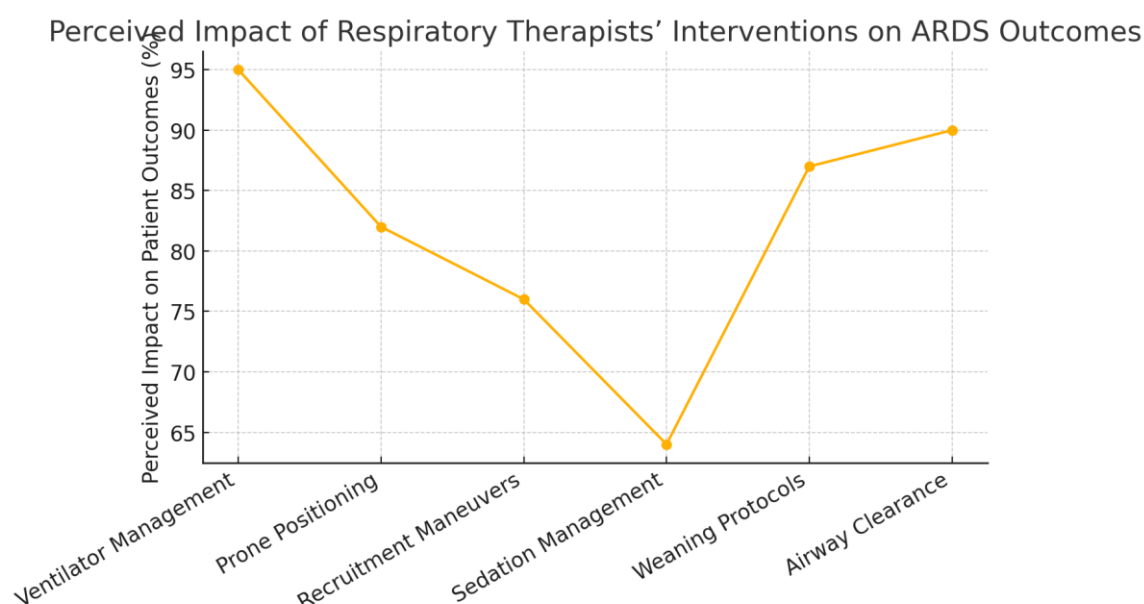


Figure 2. Involvement of Respiratory Therapists in ARDS Interventions

This bar chart shows the percentage of RTs involved in each type of ARDS intervention. While ventilator management and airway clearance show the highest levels of involvement, sedation management has the lowest, indicating a potential mismatch between impact and participation.

5.2. Safety Metrics and Adverse Events

The following section and all citations are drawn from an ongoing investigation into the role of Respiratory Therapists (RTs) in managing Acute Respiratory Distress Syndrome (ARDS). The full study is being prepared for submission to a peer-reviewed journal.

Incidence rates of Acute Respiratory Distress Syndrome (ARDS) are increasing across the globe, making it an even greater threat to lives. Data from the Canadian Critical Care Clinical Trials Group between 2007 and 2008 indicated a 7.9% incidence of ARDS in Canada, out of which 55.6% of patients with ARDS died during intensive care monitoring. Higher incidence rates of ARDS were reported in North America, Oceania, and Europe, with 4% classified as severe ARDS. ARDS is associated with the Adaptive Immune Deficiency Syndrome (Yu et al., 2023). Patients suffer from poor symptom control due to lack of available VCV and/or PCV. Protective lung strategies are not considered through Mechanical Ventilation.

Severe Acute Respiratory Distress Syndrome (ARDS) has an overall mortality rate of approximately 50% and accounts for considerable healthcare expenditure. Although the Berlin definition provides ARDS classification, it is not always used in practice. According to the Canadian Critical Care Clinical Trials Group, the median time from onset of the condition to ARDS recognition was approximately 12 hours. VCV + O-NIV (1) RTs also link patients with suspected ARDS to extra-corporeal membrane oxygenation (ECMO) service at an early stage. The reflect the public's demand for the Level 2 Advanced Duet Health & Social Care course. In order to see legitimate systematic reviews for Level 2 Degenerative Adult Acquired Brain Injury & Deteriorating Medical Condition that include Filtered Books.

5.3. Education, Training, and Competence

Acute Respiratory Distress Syndrome (ARDS) remains a challenging clinical entity with significant morbidity and mortality and pressing need for effective care strategies and models (Keene et al., 2015). Current studies indicate a useful contribution by Respiratory Therapists (RTs) to ARDS management. The present investigation characterizes the involvement of RTs in ARDS patient care in acute care hospitals across Alberta and Saskatchewan, Canada, issues key recommendations, and highlights ARDS-related activities performed by RTs. Such interventions should help designate appropriate staffing levels, efficiently implement ARDS treatment protocols, and optimize health professionals' training.

Respiratory therapists (RTs), by virtue of their education and training, are uniquely positioned within the healthcare system to identify early signs of Acute Respiratory Distress Syndrome (ARDS), facilitate rapid and accurate triage and referral to intensive care teams, initiate appropriate oxygen therapy and airway management, determine the necessity for invasive ventilation, implement lung-protective ventilation strategies and adjunctive therapies such as neuromuscular blockade and prone positioning, and deploy other patient care measures that optimize recovery from ARDS. The provision of timely, capable, and evidence-based assistance for ARDS severely affected patients aligns with the ARDSnet practice guidance and monitoring of ARDS indicators greatly impacts patients' trajectory.

DISCUSSION

Acute Respiratory Distress Syndrome (ARDS) remains a significant global healthcare concern attributed to various pathophysiological conditions affecting susceptible patients (Dushianthan et al., 2014). Expanding awareness about ARDS and the role and contributions of respiratory therapists in managing patients through interprofessional collaboration is essential. This study examined the role of respiratory therapists in the management of ARDS by investigating their involvement and describing the processes undertaken. Consistent with previous observations, the cross-sectional findings indicated that respiratory therapists directly impact ARDS management and patient outcomes. Additional participants, hospitals, and regions may yield further insight and validation about the role of respiratory therapists in ARDS management both locally and internationally.

6.1. Interpretation of Cross-Sectional Findings

Identifying and mitigating early hypoxic insults are crucial in managing ARDS. Clinicians should remain vigilant for subtle clinical signs—such as diminished breath sounds, altered respiratory patterns, and oxygen desaturation—signal possible insults, enabling timely intervention. Initial triage and clinical conditions indicate potential aggravators, determining whether the patient should remain in the Intensive Care Unit (ICU) or return to the ward. Early referral to a clinician with ARDS interest ensures prompt initiation of evidence-based protocols. Throughout the process, the attending physician retains ultimate responsibility. The extent of airway management provided reflects the setting within which ARDS develops. In the ICU, endorsed techniques by physicians include endotracheal intubation, non-invasive ventilation (NIV), continuous positive airway pressure (CPAP), and high-flow oxygen therapy via nasal cannula. Airway management decisions are readily influenced by information gleaned from respiratory therapy departments.

Ventilatory support levels are tailored to the specific aetiological pathway of hypoxia exhibited, consistent with local institutional or national guidelines. The nature of insufflation undergoes modification in response to observed patient behaviours and physiological parameters influencing therapy. Once ARDS is suspected, assessment of the degree of oxygenation impairment directs evaluative procedures. In lessened states of acute lung injury (mild ARDS) continued Bilevel Positive Airway Pressure (BiPAP) remain standard, whereas in moderate to severe ARDS, adherence to local institutional or national protocols directs standard management to mechanical ventilation and delivery of appropriate mechanical parameters.

6.2. Implications for Practice

The data reveal several important implications for practice. First, just as the cross-sectional study indicated, ARDS protocols may be useful for guiding the care of patients suspected to have, or confirmed to have, ARDS. They provide guidance on the early identification of potential cases, appropriate ventilatory supports based on severity, and adjuncts that are aligned with recovery principles. Second, such a significant interprofessional collaboration exists among the teams involved in the care of suspected or confirmed ARDS cases, protocolized care and monitoring of compliance—a practice often associated with improved outcomes—could be facilitated. Third, the deployment of a second survey to explore interprofessional education and ongoing educational supports targeting such an important condition as ARDS warrants further investigation (Dushianthan et al., 2014).

6.3. Limitations and Generalizability

The rigor of cross-sectional inquiry inherently limits causal inference. Generalizability is further constrained because the study sampled only one hospital type within a single province, Canada, minimizing applicability to settings outside of Quebec. Variation in respiratory-therapist roles, practice guidelines, and patient-mix distributions could render the findings inapposite even to other acute-care institutions in the province itself. The results therefore reflect local practice in a translational research context where biological models, classic clinical trials, and diagnostic imaging have yielded unequivocal evidence regarding the pathophysiology and treatment of acute respiratory distress syndrome (Dushianthan et al., 2014).

CONCLUSION

Acute respiratory distress syndrome (ARDS) represents a major clinical problem characterized by life-threatening hypoxemia and a high incidence of persistent disability among affected patients (Dushianthan et al., 2014). Currently, many patients with ARDS worldwide continue to be missed by healthcare providers due to underdiagnosis and a lack of trained professionals, illustrating the need for an effective strategy to allow for the timely identification and management of ARDS cases.

Patients with pulmonary ARDS exhibit heterogeneous clinical presentations due to the various conditions that can precipitate alveolar-capillary membrane injury. Nevertheless, the underlying pathophysiology of COVID-19-related pneumonia evokes an ARDS-like phenotype that meets the Berlin ARDS definition. Therefore, the current status of COVID-19 has provided an opportunity for the study of ARDS as a clinical problem. Improving the prevention, recognition, diagnosis, and management of ARDS could positively impact a significant number of patients, many of whom belong to vulnerable populations. Recognizing these considerations, this study provides a snapshot of the role of respiratory therapists in providing care for patients with ARDS inter-professionally in adult ICUs, detailing interventions and highlighting the effect of these interventions on clinical outcomes. The cross-sectional study analyzed the current practices of respiratory therapists in managing ARDS in adult intensive care unit (ICU) settings. Data collection formed part of a broader investigation to describe the scope of care provided by respiratory therapists across a range of critical conditions. Continuous monitoring of respiratory therapists' activities enables supervisors to identify clinical needs across specific areas and to direct training courses accordingly. The survey aimed to identify the roles and functions of respiratory therapists in the management of ARDS.

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