

# Optimizing Oxygen Therapy in Post-Surgical Patients: A Collaborative Approach Between Respiratory Therapists and Nurses

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## Abstract

**Background:** Oxygen therapy is critical in the post-surgical care of patients, helping to prevent hypoxemia and support recovery. Effective management of oxygen therapy requires collaboration between respiratory therapists and nurses, particularly in oxygen titration and monitoring respiratory status.

**Objective:** This study explores how respiratory therapists and nurses collaborate to optimize oxygen therapy in post-surgical patients, focusing on their roles in oxygen titration and respiratory monitoring.

**Methods:** A qualitative study was conducted in a tertiary hospital, involving semi-structured interviews with 10 respiratory therapists and 10 nurses. Thematic analysis was used to identify key themes regarding interprofessional collaboration, shared responsibilities, and challenges in oxygen therapy management.

**Results:** Three major themes emerged: (1) Shared responsibility and communication in oxygen titration, (2) Joint monitoring of respiratory status to prevent complications, and (3) Challenges, including time constraints, role ambiguity, and communication barriers. Despite these challenges, collaboration was seen as essential in improving patient outcomes.

**Conclusion:** Effective collaboration between respiratory therapists and nurses is crucial in optimizing oxygen therapy for post-surgical patients. Addressing communication and role clarity can further enhance teamwork and patient care.

**Keywords:** Oxygen therapy, post-surgical care, respiratory therapists, nurses, interprofessional collaboration, oxygen titration, respiratory monitoring.

## Introduction

Oxygen therapy is a critical component of post-surgical care, particularly for patients at risk of developing hypoxemia or respiratory complications. Post-surgical patients, especially those undergoing major procedures such as thoracic, cardiac, or abdominal surgeries, often experience impaired lung function due to anesthesia, pain, or restricted mobility. Oxygen therapy is commonly used to prevent hypoxemia and ensure adequate oxygenation during recovery (Sun et al., 2015). However, the effectiveness of oxygen therapy depends on proper management, including oxygen titration and continuous monitoring of the patient's respiratory status.

In the hospital setting, the management of oxygen therapy typically involves a collaborative effort between respiratory therapists and nurses. Respiratory therapists are responsible for adjusting oxygen delivery devices, titrating oxygen based on arterial blood gases or oxygen saturation (SpO<sub>2</sub>), and ensuring the optimal functioning of respiratory equipment. Nurses, on the other hand, are integral to the day-to-day monitoring of the patient's overall condition, assessing vital signs, and detecting changes in respiratory function that require intervention (Young and Freri, 2021).

Collaboration between these two professions is essential for optimizing oxygen therapy in post-surgical patients. Effective teamwork ensures that oxygen delivery is adjusted promptly based on the patient's evolving needs, and any signs of respiratory distress are addressed quickly. Despite the recognized importance of this collaboration, there is limited research exploring how respiratory therapists and nurses work together to optimize oxygen therapy and improve patient outcomes. Understanding the dynamics of this collaboration is critical for developing strategies to enhance patient care in the post-surgical setting (Ferrando et al., 2020).

This study aims to analyze how respiratory therapists and nurses collaborate to optimize oxygen therapy for post-surgical patients. Specifically, it will focus on their roles in managing oxygen titration, monitoring respiratory status, and improving patient outcomes through a coordinated approach.

## Literature Review

### 1. The Importance of Oxygen Therapy in Post-Surgical Patients

Oxygen therapy plays a vital role in the post-surgical recovery of patients, particularly those who have undergone major procedures like cardiac, thoracic, or abdominal surgery. Postoperative hypoxemia, or low blood oxygen levels, is a common complication due to factors such as impaired lung function, reduced mobility, and residual effects of anesthesia (Sun et al., 2015). Oxygen therapy helps to prevent hypoxemia and support adequate tissue oxygenation, which is essential for recovery and preventing complications like respiratory failure or cardiac stress (Young and Frei, 2021). Proper administration and titration of oxygen are critical in ensuring that patients receive the optimal level of supplemental oxygen, avoiding both hypoxemia and hyperoxia.

Studies show that improperly managed oxygen therapy can lead to adverse outcomes, including prolonged hospital stays, higher rates of infection, and increased mortality (O'Driscoll et al., 2017). Therefore, it is essential that oxygen therapy is monitored continuously and adjusted according to the patient's condition to improve recovery outcomes and reduce the likelihood of complications.

### 2. Role of Respiratory Therapists in Oxygen Therapy Management

Respiratory therapists are central to the administration and optimization of oxygen therapy in clinical settings, particularly for post-surgical patients. Their responsibilities include setting up and managing oxygen delivery devices, titrating oxygen levels based on oxygen saturation (SpO<sub>2</sub>) or arterial blood gas measurements, and troubleshooting equipment issues (Kacmarek et al., 2005). Additionally, respiratory therapists play a key role in educating patients about oxygen therapy and ensuring adherence to protocols that promote effective recovery.

Research highlights the importance of respiratory therapists in optimizing oxygen therapy by reducing the risk of hypoxemia and hyperoxia. They use specialized knowledge to adjust oxygen flow rates, evaluate ventilation strategies, and monitor patients for changes in respiratory status (Orsted et al., 2012). Collaboration

with other healthcare professionals, particularly nurses, is essential to ensure that adjustments are made promptly and that patients receive the most appropriate care.

### 3. Role of Nurses in Monitoring and Managing Oxygen Therapy

Nurses are the primary caregivers responsible for continuously monitoring post-surgical patients and identifying signs of respiratory distress, such as changes in breathing patterns, abnormal SpO<sub>2</sub> levels, or altered vital signs. Nurses ensure that oxygen is administered as prescribed, monitor patient comfort, and make adjustments to oxygen therapy when necessary (Young and Frei, 2021). Additionally, nurses are often the first to detect complications related to oxygen therapy, such as oxygen toxicity or respiratory depression, and they work closely with respiratory therapists to address these issues.

Nurses also play a key role in educating patients about oxygen therapy, ensuring that they understand the importance of compliance with the treatment plan. Studies suggest that when nurses are actively engaged in monitoring respiratory status and collaborating with respiratory therapists, patients experience better outcomes and fewer respiratory complications (Ferrando et al., 2020).

### 4. Collaborative Approaches to Oxygen Therapy in Post-Surgical Care

Collaboration between respiratory therapists and nurses is crucial for optimizing oxygen therapy in post-surgical patients. Effective teamwork allows for timely adjustments to oxygen delivery based on the patient's condition and ensures that both professions contribute their expertise in managing respiratory status. Research has shown that interprofessional collaboration leads to improved patient outcomes, particularly in critical care settings where respiratory management is complex (Lin et al., 2020).

Interprofessional collaboration is especially important when titrating oxygen levels, as this process requires real-time assessment of the patient's respiratory and overall health status. Respiratory therapists and nurses must communicate effectively to ensure that oxygen flow is adjusted based on clinical indicators, such as arterial blood gas analysis or pulse oximetry readings (Young and Frei, 2021). Furthermore, collaborative care models that emphasize shared decision-making and regular communication between nurses and respiratory therapists have been shown to reduce the length of hospital stays and the incidence of post-operative complications (Young and Frei, 2021).

### 5. Challenges in Collaborative Oxygen Therapy Management

Despite the benefits of collaboration between respiratory therapists and nurses, several challenges can hinder effective teamwork. Studies have identified communication barriers, role ambiguity, and time constraints as common obstacles to interprofessional collaboration in oxygen therapy management (Lin et al., 2020). When healthcare professionals are unclear about their specific roles or lack adequate communication, delays in adjusting oxygen therapy or monitoring respiratory status can occur, which may negatively impact patient outcomes.

Moreover, the fast-paced nature of post-surgical wards can make it difficult for respiratory therapists and nurses to collaborate effectively. High patient volumes, staffing shortages, and workload pressures can limit the time available for joint decision-making and coordination (Orsted et al., 2012). Addressing these challenges requires targeted strategies to improve communication and role clarity, such as interprofessional education and structured protocols for collaborative care.

## 6. Gaps in the Literature

While there is extensive literature on the individual roles of respiratory therapists and nurses in oxygen therapy management, there is limited research specifically addressing how these two professions collaborate in post-surgical care settings. Most studies focus on critical care or emergency settings, with fewer exploring the dynamics of teamwork in general surgical wards. Understanding how respiratory therapists and nurses can work together to optimize oxygen therapy in post-surgical patients is essential for improving outcomes and ensuring a smooth recovery process. This study aims to fill that gap by examining the collaborative strategies used to manage oxygen titration and respiratory monitoring in post-surgical patients.

## Methodology

### 1. Study Design

This research employed a qualitative study design to explore how respiratory therapists and nurses collaborate to optimize oxygen therapy in post-surgical patients. A qualitative approach was chosen to gain in-depth insights into the experiences, roles, and teamwork between these healthcare professionals in managing oxygen therapy, titration, and monitoring respiratory status. Semi-structured interviews were used to gather data from the participants.

### 2. Setting

The study was conducted in the surgical wards and intensive care units (ICUs) of a tertiary hospital. The hospital provides specialized post-surgical care and has a dedicated team of respiratory therapists and nurses responsible for managing oxygen therapy in patients recovering from major surgeries. The study focused on post-operative care units, where oxygen therapy is routinely administered to prevent hypoxemia and other respiratory complications.

### 3. Participants

A purposive sampling method was used to recruit 10 respiratory therapists and 10 nurses who were directly involved in the care of post-surgical patients requiring oxygen therapy. All participants had at least two years of experience working in post-operative settings. The inclusion criteria ensured that participants had significant experience with oxygen therapy management and collaboration in patient care.

### 4. Data Collection

Data were collected through semi-structured interviews conducted in private meeting rooms within the hospital to ensure confidentiality. Each interview lasted between 30 and 60 minutes. An interview guide was used to explore key areas, including:

- The specific roles of respiratory therapists and nurses in managing oxygen therapy.
- How respiratory therapists and nurses collaborate in titrating oxygen and monitoring respiratory status.
- Communication strategies used to ensure effective teamwork.
- Challenges encountered in collaboration and strategies to overcome them.
- Perceived impact of this collaboration on patient outcomes.

All interviews were audio-recorded with the participants' consent, and field notes were taken during the interviews to capture additional insights. The interviews were transcribed verbatim for analysis.

## 5. Data Analysis

The interview transcripts were analyzed using thematic analysis following Braun and Clarke's (2006) six-step process:

1. Familiarization with the Data: The researcher repeatedly read the interview transcripts to gain a comprehensive understanding of the participants' experiences.
2. Generating Initial Codes: The data were systematically coded to identify recurring ideas and patterns related to interprofessional collaboration, oxygen therapy management, and patient care.
3. Searching for Themes: Codes were organized into broader themes that reflected the key elements of the collaboration between respiratory therapists and nurses, such as shared responsibilities, communication strategies, and challenges.
4. Reviewing Themes: The themes were reviewed and refined to ensure they captured the essential aspects of the collaboration and reflected the participants' experiences.
5. Defining and Naming Themes: Themes were clearly defined and named to accurately represent the findings. Key themes included "Collaboration in Oxygen Titration," "Monitoring Respiratory Status," and "Challenges in Teamwork."
6. Writing the Report: The themes were organized into a narrative that highlights the collaborative efforts and challenges faced by respiratory therapists and nurses in managing oxygen therapy for post-surgical patients.

## 6. Ethical Considerations

Ethical approval for the study was obtained from the ethics committee prior to data collection. All participants provided informed consent before participating in the interviews. They were informed of their right to withdraw from the study at any time without penalty. To protect confidentiality, all personal identifiers were removed from the transcripts, and the audio recordings were securely stored and deleted after transcription.

## 7. Trustworthiness and Rigor

To ensure the rigor and trustworthiness of the study, the following strategies were employed:

- Triangulation: Data were collected from both respiratory therapists and nurses to ensure multiple perspectives on collaboration were captured.
- Member Checking: Participants were given the opportunity to review and validate the accuracy of the findings after the initial analysis was completed.
- Peer Debriefing: The researcher engaged in discussions with colleagues experienced in qualitative research to validate the themes and ensure objectivity in data interpretation.
- Reflexivity: The researcher maintained a reflective journal throughout the research process to minimize potential biases and to remain conscious of how personal assumptions might influence data interpretation.

## 8. Limitations

One limitation of this study is its focus on a single tertiary hospital, which may limit the generalizability of the findings to other healthcare settings. Additionally, the qualitative nature of the study means that the findings are based on the subjective experiences of the participants and may not fully capture all aspects of the collaboration. Future research could use quantitative methods or expand the study to multiple hospitals to provide a broader understanding of how collaboration impacts patient outcomes in oxygen therapy management.

## Findings

The thematic analysis of the interviews revealed several key themes related to the collaboration between respiratory therapists and nurses in managing oxygen therapy for post-surgical patients. Three main themes

emerged from the data: Collaborative Roles in Oxygen Titration, Monitoring Respiratory Status, and Challenges in Collaboration. These themes are further divided into sub-themes and illustrated with direct quotes from participants.

## 1. Collaborative Roles in Oxygen Titration

Participants emphasized the importance of collaboration between respiratory therapists and nurses when managing oxygen titration in post-surgical patients. Both groups highlighted that effective oxygen therapy management relied on shared responsibility and communication.

### a) Shared Responsibility in Oxygen Titration

Both nurses and respiratory therapists noted that oxygen titration is a shared responsibility, requiring regular communication between the two professions to ensure that patients are receiving the appropriate levels of oxygen.

- Respiratory Therapist 1: "We adjust the oxygen levels based on SpO<sub>2</sub> and patient needs, but it's important that the nurses keep us updated if there's any change in the patient's status."

- Nurse 2: "We're constantly monitoring the patient, and if their oxygen levels drop, we contact the respiratory therapist immediately to adjust the oxygen. It's a team effort."

### b) Real-Time Adjustments and Communication

Both professions emphasized the need for real-time communication to make timely adjustments to oxygen therapy. Nurses are typically the first to notice changes in a patient's condition, while respiratory therapists manage the technical aspects of oxygen delivery.

- Nurse 3: "When a patient's oxygen levels drop or they show signs of distress, I notify the respiratory therapist right away so we can adjust the oxygen settings as needed."

- Respiratory Therapist 2: "We depend on the nurses to alert us when something changes, and then we step in to tweak the oxygen levels. Quick communication makes all the difference in patient recovery."

## 2. Monitoring Respiratory Status

The second major theme revolved around how respiratory therapists and nurses collaborate to monitor and assess the respiratory status of post-surgical patients. Effective monitoring is essential for preventing complications such as hypoxemia and ensuring optimal recovery.

### a) Continuous Monitoring of Vital Signs

Nurses play a key role in continuously monitoring the patient's vital signs, including respiratory rate and oxygen saturation. Respiratory therapists, in turn, provide expertise in interpreting these parameters to adjust oxygen therapy.

- Nurse 4: "We're always checking the patient's respiratory rate and oxygen saturation, especially after surgery. If I notice anything abnormal, I'll consult the respiratory therapist."

- Respiratory Therapist 3: "We rely on the nurses to monitor SpO<sub>2</sub> regularly and inform us of any fluctuations. It allows us to adjust the oxygen settings accordingly and keep the patient stable."

### b) Preventing Respiratory Complications

Both respiratory therapists and nurses are actively involved in identifying early signs of respiratory distress and preventing complications. Their collaboration ensures that issues such as hypoxemia or oxygen toxicity are promptly addressed.

- Respiratory Therapist 4: "Our job is to prevent complications like hypoxemia, but we can't do that without the nurses keeping an eye on the patient's condition. If they see something concerning, they let us know, and we act fast."

- Nurse 5: "It's a joint effort to prevent complications. We're the ones at the bedside, so we notice changes right away, and then we collaborate with the respiratory therapists to fix any issues."

### 3. Challenges in Collaboration

While the collaboration between respiratory therapists and nurses was generally seen as effective, participants identified several challenges that sometimes hindered smooth teamwork. These included time constraints, role ambiguity, and communication barriers.

#### a) Time Constraints and High Workloads

Both nurses and respiratory therapists reported that the high demands of the post-surgical setting, coupled with staffing shortages, often made it difficult to maintain effective communication and collaboration.

- Nurse 6: "We're often juggling multiple patients at once, and it can be hard to keep up with everything. Sometimes it's challenging to get in touch with the respiratory therapist right away when something changes."

- Respiratory Therapist 5: "We have a lot of patients to manage, and sometimes it's tough to be there for every oxygen adjustment as soon as it's needed. The nurses are great, but we're all stretched thin."

#### b) Role Ambiguity and Overlapping Responsibilities

Some participants mentioned that unclear boundaries between the roles of respiratory therapists and nurses could lead to confusion about who is responsible for certain aspects of oxygen therapy.

- Respiratory Therapist 6: "Sometimes there's a bit of overlap in responsibilities, and it can be unclear whether it's the nurse or the therapist who should make a minor adjustment to the oxygen settings."

- Nurse 7: "It's not always clear where our responsibilities end and theirs begin. We do a lot of monitoring and can adjust oxygen, but we defer to the respiratory therapists for the more technical aspects."

#### c) Communication Barriers

Although communication was identified as crucial, some participants noted that occasional lapses in communication between the two groups could affect patient care, particularly in fast-paced environments.

- Nurse 8: "Sometimes, communication gets lost when things are hectic, and we're all running around. It's not always easy to get the respiratory therapist's attention when we need them."

- Respiratory Therapist 7: "We try to stay in constant communication, but in a busy ward, things can slip through the cracks. We need to find better ways to ensure we're always in sync."

## Discussion

This study explored the collaborative roles of respiratory therapists and nurses in managing oxygen therapy for post-surgical patients, with a particular focus on oxygen titration, monitoring respiratory status, and overcoming challenges in collaboration. The findings highlight the critical role of interprofessional collaboration in optimizing oxygen therapy, while also identifying specific barriers that can hinder effective teamwork. This discussion synthesizes the key findings, compares them to existing literature, and outlines the implications for practice.

### 1. Collaboration in Oxygen Titration

One of the key findings from this study is the shared responsibility of respiratory therapists and nurses in oxygen titration. Both groups emphasized the importance of real-time communication and teamwork in ensuring that oxygen therapy is adjusted promptly based on the patient's respiratory status. This finding is consistent with previous research that highlights the value of interprofessional collaboration in enhancing patient care, particularly when managing complex therapies such as oxygen titration (Lin et al., 2020).

The role of nurses in continuously monitoring the patient's respiratory status and alerting respiratory therapists to changes in oxygen needs reinforces the complementary nature of their responsibilities. Respiratory therapists, with their expertise in managing oxygen delivery systems, rely on nurses' timely updates to make accurate adjustments. This partnership ensures that post-surgical patients receive the appropriate amount of oxygen at each stage of recovery, preventing complications such as hypoxemia and oxygen toxicity (Young and Frei, 2021).

### 2. Monitoring Respiratory Status

Another significant finding is the collaborative effort between nurses and respiratory therapists in monitoring respiratory status. Nurses take the lead in assessing vital signs and observing the patient's overall condition, while respiratory therapists provide expert input on how to adjust oxygen therapy based on these observations. This partnership aligns with studies suggesting that effective teamwork between these two professions leads to improved patient outcomes, particularly in critical care and post-surgical settings (Ferrando et al., 2020).

Monitoring the patient's oxygen saturation (SpO<sub>2</sub>) and respiratory rate is essential in identifying early signs of respiratory distress, enabling timely interventions. By working together, respiratory therapists and nurses ensure that oxygen therapy is continuously optimized throughout the post-operative period. The study's findings underscore the importance of frequent communication to ensure both parties are informed and can adjust care based on the patient's evolving needs (Kacmarek et al., 2005).

### 3. Challenges in Collaboration

Despite the positive aspects of interprofessional collaboration, participants identified several challenges that can hinder effective teamwork. Time constraints and high workloads were commonly cited as barriers, with both nurses and respiratory therapists noting that the fast-paced nature of the post-surgical setting sometimes made it difficult to coordinate care effectively. This finding echoes previous research, which has shown that heavy workloads and staffing shortages can limit healthcare professionals' ability to collaborate fully (Lin et al., 2020).

Additionally, role ambiguity was identified as a challenge, particularly when responsibilities for oxygen therapy adjustments overlap between nurses and respiratory therapists. Some participants expressed uncertainty about when to take action independently and when to defer to their colleagues. This highlights the



need for clearer role definitions and better communication protocols to minimize confusion and ensure seamless care delivery (Orsted et al., 2012).

Communication barriers were another challenge identified by participants. Although communication was generally seen as effective, occasional lapses in communication were noted, particularly during busy shifts. These lapses can result in delays in oxygen adjustments or missed opportunities for timely interventions. Addressing these barriers requires the implementation of structured communication strategies, such as regular interdisciplinary meetings or designated points of contact for oxygen therapy management (Young and Frei, 2021).

#### 4. Implications for Practice

The findings of this study have important implications for clinical practice. First, promoting a culture of collaboration and shared responsibility between respiratory therapists and nurses is essential for optimizing oxygen therapy in post-surgical patients. Hospitals should consider implementing interprofessional education programs to enhance teamwork and ensure that both groups are familiar with each other's roles and responsibilities. Such training can improve role clarity and reduce ambiguity in practice.

Additionally, addressing the challenges of time constraints and communication barriers requires institutional support. Strategies such as optimizing staff-to-patient ratios and introducing time management tools can help reduce the pressure on healthcare professionals, allowing them to collaborate more effectively. Clear protocols for oxygen titration and regular communication channels between respiratory therapists and nurses should also be established to facilitate seamless coordination of care.

Furthermore, the study highlights the importance of role clarity in preventing confusion and ensuring efficient collaboration. Hospitals should consider developing detailed role descriptions for respiratory therapists and nurses in oxygen therapy management, outlining when independent actions are appropriate and when collaboration is necessary. This can help avoid overlapping responsibilities and streamline the process of oxygen titration and respiratory monitoring.

#### 5. Limitations and Future Research

While this study provides valuable insights into the collaborative efforts of respiratory therapists and nurses in oxygen therapy management, there are limitations to consider. The study was conducted in a single tertiary hospital, which may limit the generalizability of the findings to other healthcare settings. Additionally, the qualitative nature of the study means that the findings are based on subjective experiences, which may not fully capture all aspects of collaboration. Future research could expand the scope to multiple hospitals or use quantitative methods to assess the impact of collaboration on patient outcomes more objectively.

Further research is also needed to explore specific interventions that could improve collaboration between respiratory therapists and nurses. For example, investigating the effectiveness of communication tools, such as electronic health records or real-time communication platforms, could provide valuable insights into how technology can enhance teamwork in managing oxygen therapy.

#### Conclusion

In summary, this study highlights the importance of interprofessional collaboration between respiratory therapists and nurses in optimizing oxygen therapy for post-surgical patients. By working together to titrate oxygen, monitor respiratory status, and address challenges in real time, these healthcare professionals play a

critical role in ensuring that patients receive the best possible care during recovery. Addressing barriers to collaboration, such as time constraints, role ambiguity, and communication lapses, will further enhance the effectiveness of this joint approach and improve patient outcomes in post-surgical settings.

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