Safe and Effective Use of High Flow Nasal Cannula (HFNC) in Pediatric Respiratory Care

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ABSTRACT

Respiratory distress is a leading cause of pediatric hospital admissions worldwide. High Flow Nasal Cannula (HFNC) therapy is a non-invasive oxygen delivery method widely used in children with acute respiratory conditions. By providing heated, humidified oxygen at high flow rates, HFNC improves oxygenation, reduces work of breathing, and enhances patient comfort. Evidence shows that HFNC can reduce the need for invasive ventilation, shorten hospital stays, and improve outcomes in children with moderate respiratory distress. Safe use requires strict adherence to clinical guidelines, continuous monitoring, and well-trained staff.



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INTRODUCTION

Children are highly susceptible to respiratory illnesses such as bronchiolitis, pneumonia, and asthma exacerbations, which remain among the leading causes of morbidity and hospitalization. Conventional oxygentherapy may be insufficient for those in moderate respiratory distress, while invasive ventilation carriessignificant risks. High Flow Nasal Cannula (HFNC) therapy has emerged as an effective alternative,providing both clinical and comfort benefits in pediatric patients. Safe and effective use of High Flow Nasal Cannula (HFNC) supports World Patient Safety Day 2025, themed **"Patient safety from the start!".** This focus on **safe care for every newborn and every child** ensures that respiratory support is delivered with safety, effectiveness, and equity in mind to optimize outcomes for every child.

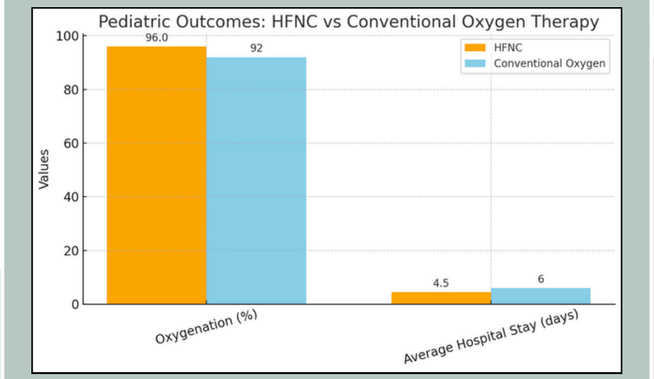
METHODS AND MATERIALS

- **Population:** Children aged **1 month–12 years** admitted with moderate respiratory distress.
- **Intervention:** High Flow Nasal Cannula (HFNC) therapy delivering heated, humidified oxygen at flow rates up to **60L/min**, adjusted by weight and age.
- **Monitoring:** Continuous monitoring of **SpO_2, heart rate, respiratory rate, and patient comfort** during therapy.
- **Comparison:** Outcomes evaluated against children receiving conventional oxygen therapy and those requiring escalation to invasive ventilation.

RESULTS

Children treated with high-flow nasal cannula (HFNC) had better clinical outcomes compared to those on conventional oxygen therapy. The mean oxygen saturation was higher in the HFNC group (96%) than in the conventional oxygen group (92%). The average hospital stay was also shorter among children receiving HFNC (4.5 days) compared to those on conventional oxygen (6 days).

GRAPHS AND TABLES



- Children using **HFNC** had **better oxygen levels (96%)** compared to those on conventional oxygen (92%).
- Hospital stay was also **shorter with HFNC with 4.5 days** as compared to conventional oxygen with 6 days.
- This shows that **HFNC is more effective, safer, and helps children recover faster** than conventional oxygen therapy.

DISCUSSION

High Flow Nasal Cannula (HFNC) therapy offers significant benefits in managing pediatric respiratory distress, especially in bronchiolitis and pneumonia. Its ease of use, patient comfort, and ability to reduce the need for invasive ventilation make it a preferred option in many pediatric wards. Successful outcomes, however, rely **on careful patient selection, appropriate flow settings, and trained staff.** Challenges remain, including **equipment cost, availability, and the importance of clear escalation protocols** when HFNC is insufficient.

CONCLUSION

High Flow Nasal Cannula (HFNC) is a **safe, effective, and well-tolerated** non-invasive respiratory support for children with moderate respiratory distress. It improves oxygenation, and shortens hospital stays. Incorporating HFNC into pediatric care protocols — with proper monitoring and staff training — ensures **safer and more effective respiratory management** in children, supporting the vision of **"Safe Care for Every Newborn and Every Child."**

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