

Audit of the Use of High Flow Humidified Oxygen Therapy (HFHOT) On The General Paediatric Ward

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Introduction

The use of High Flow Humidified Oxygen Therapy (HFHOT) has increased in recent years⁽¹⁾ including in infants with bronchiolitis.⁽²⁾ The humidified and heated oxygen delivered through simple nasal cannula has resulted in better tolerance of flow higher than used before.⁽³⁾ HFHOT has been used either as a step-up modality for patients on standard oxygen therapy or as a step-down mode of respiratory support for invasively ventilated patients upon extubation.⁽⁴⁾ Its uses has resulted in the reduction of the used of Non-Invasive and Invasive Ventilation on Intensive Care Units, freeing up critical care space.⁽⁵⁾ HFHOT was introduced on general paediatric ward during the 2017/18 winter. This audit aims at ascertaining the adherence to, guidelines, the safety of ward-based HFHOT and the impact on critical care beds at Hull Royal Infirmary.

Method

Audit of infants 0-24 months old admitted to the general paediatric wards at Hull Royal Infirmary with the clinical diagnosis of bronchiolitis, Viral Induced Wheeze (VIW) and Lower Respiratory Tract Infections, (LRTI) from 1 October 2018 to 31 March 2019 and on whom HFHOT was initiated. Children > 2 year were excluded. Data was collected prospectively on a proforma. The audit was approved by the health group (Women and family health group, Hull University Teaching hospitals NHS Trust). Guidelines (Bristol & Wales) were used as standard.

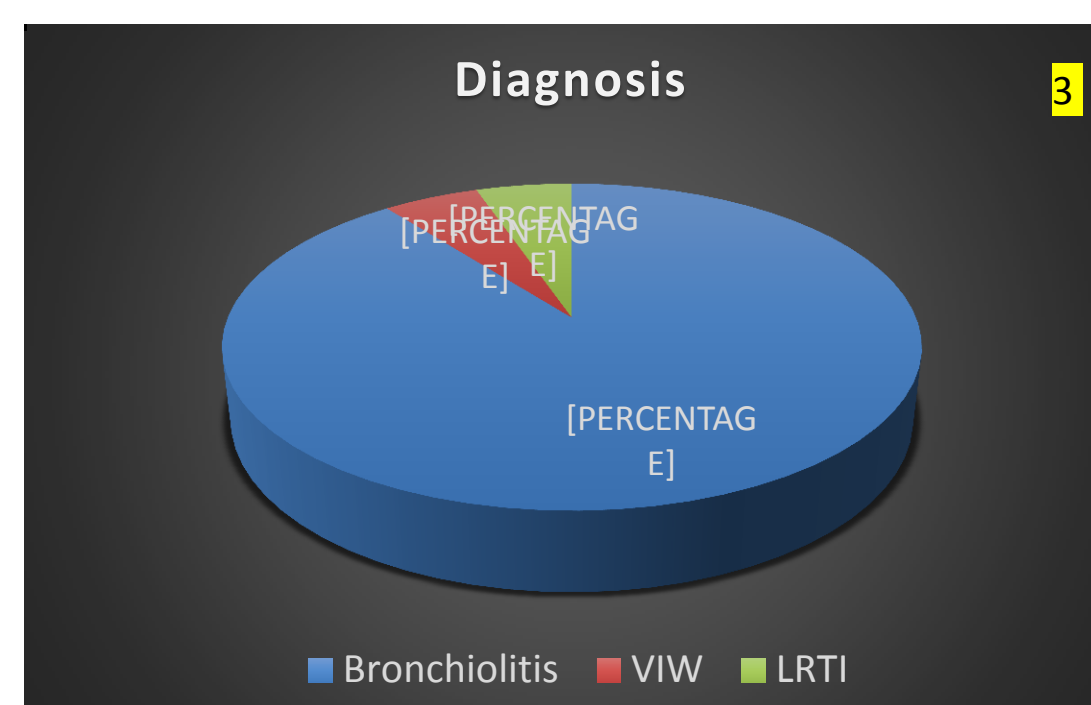


Results

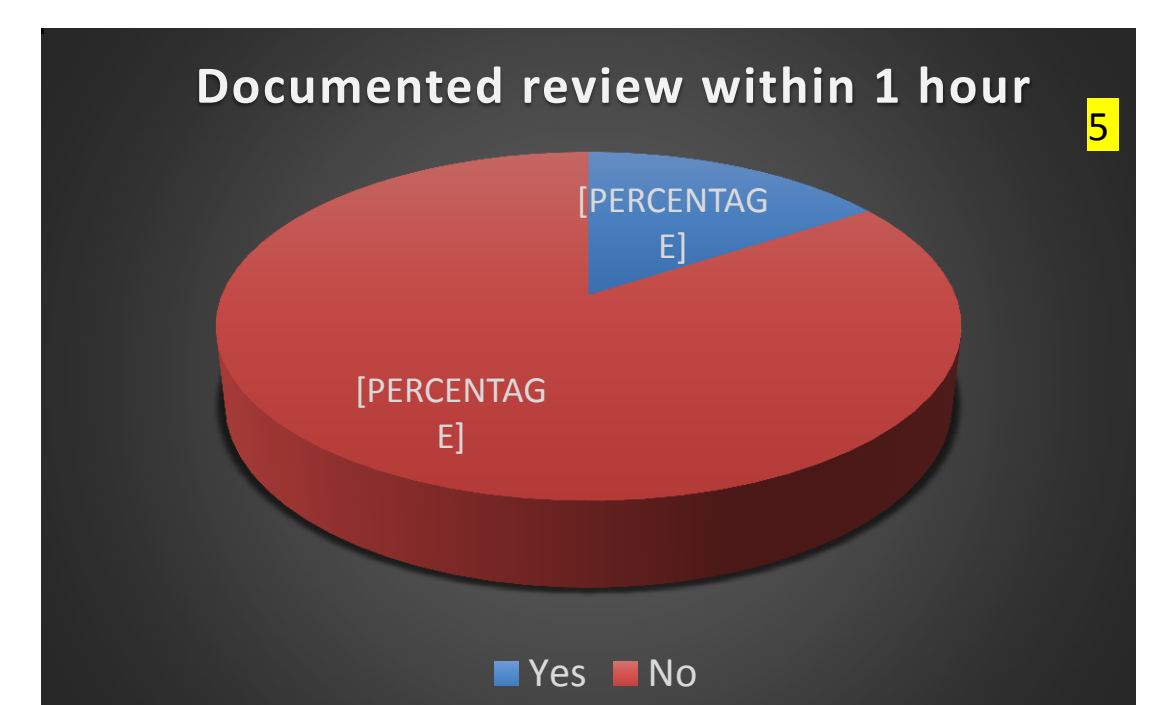
Results

- n=38; Males: 58%
- Mean age: 5 months
- 90% had Bronchiolitis
- 2 with complex background - both stayed on the ward
- 10 admitted on PHDU, but only 2 of them had escalated therapy in PHDU

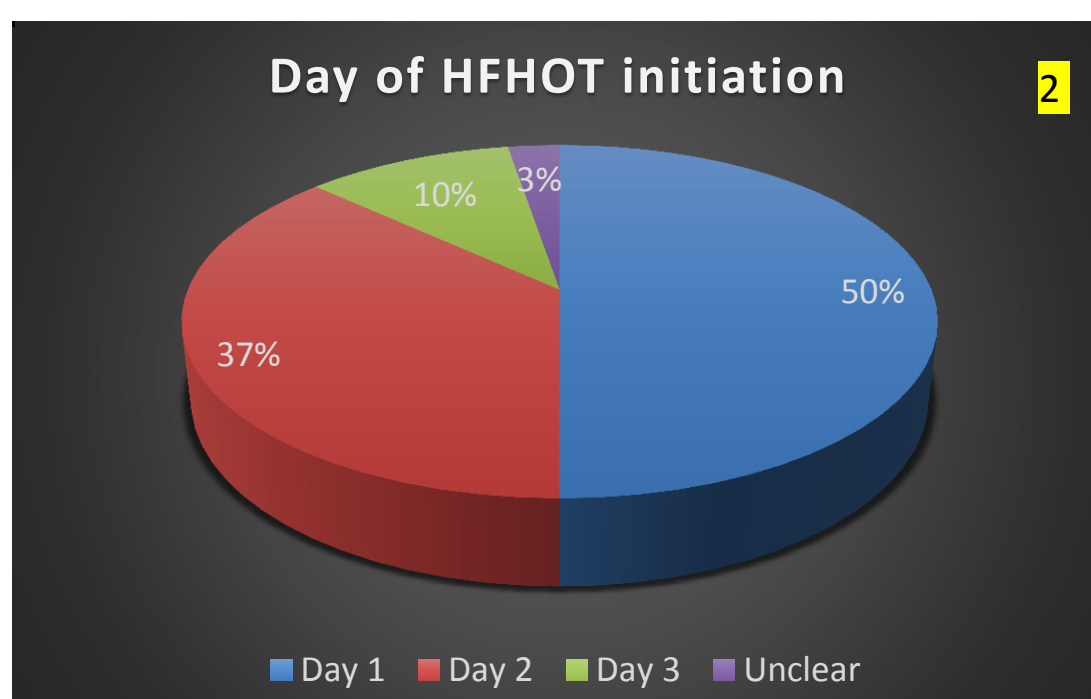
Diagnosis



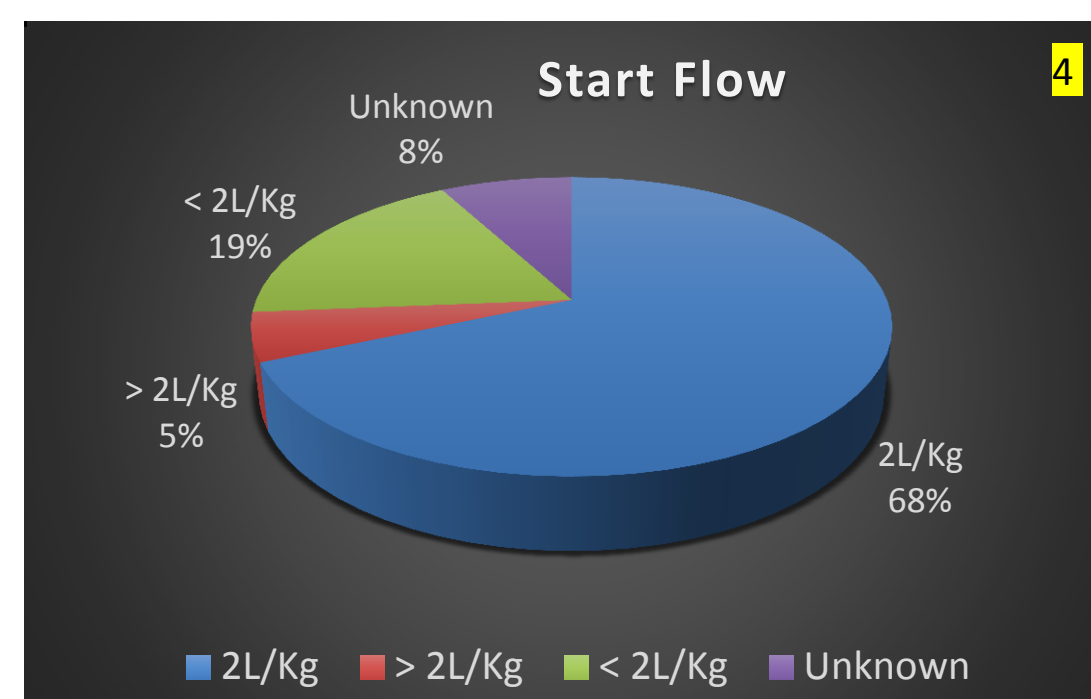
Documented review within 1 hour



Day of HFHOT initiation



Start Flow



Weaning Strategy



Discussion & Conclusion

Initiation of HFHOT was mainly a clinical decision. However, less than quarter had a medical review within an hour to ascertain effectiveness of the HFHOT. Though the majority (68%) were started on the recommended flow of 2L/kg/min some were started on either a low flow or higher flow outside the guidelines which impacted their weaning regime but with no adverse reactions recorded. Two infants with complex background were managed on the ward instead of PHDU and both had no adverse outcome. Only 2 of the 10 infants transferred to PHDU needed escalation on therapy. Overall this audit showed that ward-based HFHOT is generally safe for infants 0-24 months admitted with Bronchiolitis and with no complex medical background. These results also showed that during bronchiolitis seasons when bed pressures for both general and critical care are the highest, selected infants/children would benefit from ward-based HFHOT, therefore freeing up PHDU beds for the more critically ill patients, reducing transfers to regional centres for lack of local capacity; making HFHOT financially beneficial.

Recommendations: 1: Adherence to flow of 2L/kg/min; 2. Improve rates of medical review after initiation of HFHOT; 3. Weaning strategy: to reduce oxygen only; 4. Admit patients with complex medical backgrounds needing HFHOT on PHDU

References:

- 1) Frat, J. P., Brugiere, B., Ragot, S., Chatellier, D., Veinstein, A., Goudet, V., ... & Girault, C. (2015). Sequential application of oxygen therapy via high-flow nasal cannula and noninvasive ventilation in acute respiratory failure: an observational pilot study. *Respiratory care*, 60(2), 170-178
- 2) Guillot, C., Le Reun, C., Behal, H., Labreuche, J., Recher, M., Duhamel, A., & Leteurtre, S. (2018). First-line treatment using high-flow nasal cannula for children with severe bronchiolitis: Applicability and risk factors for failure. *Archives de Pédiatrie*, 25(3), 213-218.
- 3) Franklin, D., Dalziel, S., Schlapbach, L. J., Babi, F. E., Oakley, E., Craig, S. S., ... & Gibbons, K. (2015). Early high flow nasal cannula therapy in bronchiolitis, a prospective randomised control trial (protocol): A Paediatric Acute Respiratory Intervention Study (PARIS). *BMC pediatrics*, 15(1), 183.
- 4) Ischaki, E., Pantazopoulos, I., & Zakythinos, S. (2017). Nasal high flow therapy: a novel treatment rather than a more expensive oxygen device. *European Respiratory Review*, 26(145), 170028.
- 5) Pirret, A. M., Takerej, S. F., Matheson, C. L., Kelly, M., Strickland, W., Harford, J., ... & Allan, C. P. (2017). Nasal high flow oxygen therapy in the ward setting: A prospective observational study. *Intensive and Critical Care Nursing*, 42, 127-134.