It’s Just Hot Air – Isn’t It?

Jay Mekwan
No Commercial Bias or Funding
Objectives

- Look at high flow nasal Cannulae
- How good is it really?
- Evidence
78 yr M

- Known heart failure, coming to SJRH to have routine blood work
- Acutely SOB, with reduced GCS
- P70-40, RR 8, Sats 65%, GCS E2M3V2
- Intermittently loses pulse, requiring CPR

WHAT NOW??
What we know about O2 delivery

- Cannulae, facemask, reservoir masks; FiO2 and flow rates limited
- Dry air is poorly tolerated
- Positive pressure (CPAP, BiPAP) is useful, but masks often poorly tolerated
Our device, Optiflow
Lit Search

- Mainly over the last 8 years
- Lots on neonatal and infant use
- Limited amounts on adults
<table>
<thead>
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<tbody>
<tr>
<td>0</td>
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<tr>
<td>0.5</td>
<td>VERY, VERY SLIGHT (just noticeable)</td>
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<tr>
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<td>VERY SLIGHT</td>
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<tr>
<td>2</td>
<td>SLIGHT</td>
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<tr>
<td>3</td>
<td>MODERATE</td>
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<td>4</td>
<td>SOMEWHAT SEVERE</td>
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<tr>
<td>5</td>
<td>SEVERE</td>
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<td>6</td>
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<td>7</td>
<td>VERY SEVERE</td>
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<tr>
<td>8</td>
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<tr>
<td>9</td>
<td>VERY, VERY SEVERE (almost maximal)</td>
</tr>
<tr>
<td>10</td>
<td>MAXIMAL</td>
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</table>
• Single center, prospective, observational trial over 4 months
• Small numbers
• Showed HFNC reduced resp rate, sensation of dyspnoea and improved O2 Sats
• Good tolerance of device
A Preliminary Randomized Controlled Trial to Assess Effectiveness of Nasal High-Flow Oxygen in Intensive Care Patients

Rachael L Parke MHSc, Shay P McGuinness, and Michelle L Eccleston RN

Respiratory Care • March 2011 Vol 56 No 3

- Single centre, prospective, randomised, comparative trial
- Vascular & cardiac ICU
- Fewer desaturations, and requirements for NIV compared to facemask O₂
- Better tolerance of HFNC
- Small numbers
- Validity
- Funding
Oxygen delivery through high-flow nasal cannulae increase end-expiratory lung volume and reduce respiratory rate in post-cardiac surgical patients

A. Corley¹*, L. R. Caruana¹, A. G. Barnett², O. Tronstad¹ and J. F. Fraser¹

- Single center, prospective interventional trial
- Low flow O₂ vs HFNC in cardiac surgery patients
- Showed HFNC increased airway pressure by 3cmH₂O
- Reduced Resp rate and dyspnoea
- More significant in larger BMI
- Small number
- Funded
• Compared HFNC to facemask +nasal prongs
• Single centre, prospective, comparative trial (Spain)
• HFNC better tolerated
• Reduced resp rate and improved PaO2
• Adverse effects, initial cervico-thoracic pain, x1 person complained of temp of O2
• Small numbers
• 2 authors “relationship” with manufacturer of optiflow
What is the evidence for the use of high flow nasal cannula oxygen in adult patients admitted to critical care units? A systematic review

Kernick J, Magarey J

CRD summary
The review concluded that humidified high flow nasal cannula may be useful as an intermediate therapy to improve oxygenation in adult critical-care patients. The review had some methodological problems and there were quality concerns with the data, which limit the reliability of the authors’ conclusions.
Pending data

- Cochrane review
Why does it all matter?
Preoxygenation and Prevention of Desaturation During Emergency Airway Management

Scott D. Weingart, MD, Richard M. Levitan, MD

From the Division of Emergency Critical Care, Department of Emergency Medicine, Mount Sinai School of Medicine, New York, NY (Weingart); and the Department of Emergency Medicine, Thomas Jefferson University Hospital, Philadelphia, PA (Levitan).

Patients requiring emergency airway management are at great risk of hypoxemic hypoxia because of primary lung pathology, high metabolic demands, anemia, insufficient respiratory drive, and inability to protect their airway against aspiration. Tracheal intubation is often required before the complete information needed to assess the risk of periprocedural hypoxia is acquired, such as an arterial blood gas level, hemoglobin value, or even a chest radiograph. This article reviews preoxygenation and peri-intubation oxygenation techniques to minimize the risk of critical hypoxia and introduces a risk-stratification approach to emergency tracheal intubation. Techniques reviewed include positioning, preoxygenation and denitrogenation, positive end expiratory pressure devices, and passive apneic oxygenation. [Ann Emerg Med. 2012;59:165-175.]
Weingart/Levitan Recommend

- Pre-oxygenate all ED RSIs
- Standard reservoir facemask with highest flow possible
- Pre-oxygenate for 3 mins
- CPAP, NIPPV, PEEP valves should be considered if unable to obtain Sats >93-95% with high flow O2
- Pre-oxygenate with patient’s head elevated
- Apnoeic oxygenation can extend duration of safe apnoea (nasal cannula 15L/min)
Back to the case

- Used optiflow (initially to pre-oxygenate)
- Improved Sats to 97%, GCS 15, diuresis,
- Recovered well, admitted for 2 days
Summary

- Quick, likely effective method of oxygen delivery
- May be useful pre RSI
- May result in RSI not being required