Setting up non invasive ventilation on acutely ill patients

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Aims

- Why
- Who
- When
- Where
- How
Acute NIV

“... NIV should be made available 24 hours per day in all hospitals likely to admit such patients.”

(BTS 2002)

“... an NIV service be established in each acute Trust for the management of patients with acute respiratory failure…”

(NHS Modernisation Agency 2002)

Key priority (NICE COPD Guideline 2004)

RCP BTS Guidelines 2008
Benefits of NIV

- Grade A evidence
- Reduced mortality (50%, NNT 10)
- Increased one year survival
- Reduced length of stay (3.5 days)
- Reduced intubation rates (44%)
- Cost effective
Who may need NIV?

• Alveolar hypoventilation
  - COPD
  - Neuromuscular disease
  - Chest wall deformities
  - Decompensated obstructive sleep apnoea
  - Pulmonary oedema??

• Acute type II hypercapnic respiratory failure

• Respiratory acidosis (pH<7.35 & high pCO₂)
Respiratory acidosis

- Best marker of severity of exacerbation
- Associated with greater mortality
- Up to 25% mortality if pH < 7.26
- 20% of all COPD are acidotic
- Made worse by oxygen
Contraindications

- Facial trauma or burns
- Vomiting
- Upper airway obstruction
- Consent
Contraindications?

• Bowel obstruction, GI surgery
• Severe co-morbidity
• Copious secretions
• Facial, upper airway or GI surgery
• Impaired consciousness/confusion
• Haemodynamic instability on inotropes
• Undrained pneumothorax
• Inability to protect airway
Who not to treat with NIV

- Type I hypoxaemic respiratory failure
- Compensated type II respiratory failure
- Acute asthma
- Cardiogenic pulmonary oedema (unless unsuccessful with CPAP?)
- Patients who require immediate intubation
Oxygen protocols

• Treat life threatening hypoxia
  – \( \text{PaO}_2 < 6.7 \text{KPa (50mmHg)} \)
  – Chronic patients acclimatised to low \( \text{PaO}_2 \)

• **Titrate oxygen to maintain \( \text{SpO}_2 \) 88-92%**
  – One hour of controlled oxygen
  – Repeat ABG
Before initiating……

• Optimal medical treatment
  – Bronchodilators, steroids, CxR
  – Possibly: antibiotics, diuretics
  – Controlled oxygen, SpO\textsubscript{2} 88-92%

• **Document ceiling of treatment**

• Doctor ST2 or above or other competent HCP

• Contingency plans in place e.g. IPPV
Before initiating……

• Where to initiate:
  – Trained staff & equipment
  – 1 RN for every 2 NIV pts in 1\textsuperscript{st} 24hrs

• Lower pH < 7.26 critical care setting

• Probably nothing to loose by trying NIV?? \textsuperscript{(Conti et al 2002)}
Masks
Size, Fit and Comfort

- Full face mask mainly used
- Sizing, mouth open for full face
- Small leak acceptable, not too tight
- Dentures in: good secure fit
- Nasal no good
  - Mouth breathers, nasal obstruction
- Total face masks
Other bits

• Smooth bore tubing
• Bacterial filter
  – Low resistance!
• Machine filters
• Exhalation port – one!
• Oxygen port
Monitoring

- Synchronisation
- Big leaks
- Continuous SpO2 & ECG 1st 12hrs
- Respiratory rate
- Heart rate
- Chest wall movement
- Mental state
- ABGs
Set up

- Pressures
  - Start: EPAP 4 cmH$_2$O, IPAP 12cmH$_2$O
  - Increase IPAP by 2-5cmH$_2$O up to 20 cmH$_2$O, comfort & pH>7.35
  - Titrate oxygen SpO2 88-92%
- Repeat ABG 1 hour after, change in settings, at 4 & 12 hrs
- Back up rate
Discontinuing NIV

- No set criteria: patient stable
- Breaks: eat, drink, physio, medication
- Most of 1\textsuperscript{st} 24hrs
- Wean off in day, continue nocte 2-3 days?
- Discontinue:
  - Morning or early PM
  - Establish controlled O2
  - Repeat ABG
Conclusions

- Why: saves lives
- Who: respiratory acidosis
- When: ASAP
- Where: anywhere, competency
- How: skill