Management of the Acutely Breathless Patient

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Cardiovascular Updates for Doctors & Allied Healthcare Professionals Symposium

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CONTENT

• Initial Assessment
• Basic airway and oxygen management
• Recognise and manage immediately life threatening conditions
• To manage common conditions causing breathlessness requiring hospital admission
Organs Involved in Breathlessness

- nasal cavity
- pharynx
- larynx
- epiglottis
- trachea
- bronchus
- right lung
- diaphragm
- pleural cavity
- left lung
- heart
- respiratory center
Breathlessness Algorithm

- Initial Assessment
- Airway
- Vital Signs
- Oxygenation
- History
- Examination
- Diagnosis
- Management
Initial Assessment

• Stridor and Expiratory Wheeze
• Use of accessory muscles, Intercostal recession
• Unable to Lie down
• Inability to speak in whole sentences
• Decreased Consciousness
VITAL SIGNS

- Respiratory rate and effort
- SpO2
- Pulse rate
- Blood pressure
- Temperature
- Peak expiratory flow rate (PEFR)
- Orientation and Glasgow coma score
SIGNS OF SEVERITY

- Respiratory rate > 25
- Decreased breath sounds
- Oxygen saturation <92% on air
- PEFR < 33% of normal
- Hypercapnia
- Tachycardia > 120
Check for Obstruction

1) Head tilt/chin-lift maneuver
2) Jaw-thrust maneuver

Secure the airway (Guedal, nasopharyngeal tube, intubation)
Check for Obstruction

1) Head tilt/chin-lift maneuver
   Opens the common cause of obstruction, the tongue

2) Jaw-thrust maneuver
Guedal Airway

**FIGURE 3-5a** Measure to assure correct size.

**FIGURE 3-5b** Insert with top pointing up toward roof of mouth.

**FIGURE 3-5c** Advance while rotating 180°.

**FIGURE 3-5d** Continue until flange rests on the teeth.
**Nasopharyngeal Airway**

**INSERTING A NASOPHARYNGEAL AIRWAY**

**FIGURE 3-9a** Measure the airway.

**FIGURE 3-9b** Lubricate it with water-soluble lubricant.

**FIGURE 3-9c** Insert with the bevel toward the septum or the base of the tonsil.

**Table 3-2 Recommended Nasopharyngeal Airway Sizes**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>Large Adult</td>
<td>8.0 to 9.0 i.d.</td>
</tr>
<tr>
<td>Medium Adult</td>
<td>7.0 to 8.0 i.d.</td>
</tr>
<tr>
<td>Small Adult</td>
<td>6.0 to 7.0 i.d.</td>
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OXYGEN ADMINISTRATION

- Nasal Cannula: 2-6 lpm; 25-50%
- Basic Mask: 6-10 lpm; 35-60%
- Non Rebreather: 10 & higher lpm; 60-95%
- Venturi Mask
- BVM: Air 21%
  15 L w/o reservoir 50%
  15 L w/reservoir up to 95%

FIGURE 3-39 Oxygen delivery equipment.
OXYGEN ADMINISTRATION

**FIGURE 3-40a** Nasal cannula.

**FIGURE 3-40b** Nasal cannula applied to patient.
FIGURE 3-42a  Nonrebreather mask.

FIGURE 3-42b  Nonrebreather mask applied to patient.
OXYGEN ADMINISTRATION
BAG and MASK

One-person bag-valve-mask method.
History, Examination, Differential Diagnosis 5 Ps

- Asthma, coPd
- Pulmonary Oedema
- Pneumonia
- Pneumothorax
- Pulmonary Embolism
Investigations of Breathlessness

- Chest radiography
- Electrocardiography
- N-terminal B-type natriuretic peptide levels
- FBC, renal function, glucose level, troponin level
- Arterial blood gas
- Transthoracic echocardiography
- Central venous line or pulmonary artery catheter
1 ASTHMA diagnosis

- Wheezing
- Nocturnal Cough
- History of Asthma and Atopy (Eczema)
- Precipitated by Cold / Exercise
- Inhalers
- Decreased PEFR
COPD diagnosis

- Wheezing
- Increased sputum
- **Smoking**
- Inhalers
- Cor Pulmonale (right sided HF)
ACUTE ASTHMA / COPD

• High concentration oxygen via non-rebreathing mask
• COPD – limit oxygen to 28% Venturi Mask

• Wheezing - Nebulised b2 agonist (salbutamol 5 mg)
• Asthma / COPD - Nebulised anticholinergic (ipratropium bromide 0.5 mg)
• Asthma / COPD – IV corticosteroids (hydrocortisone 200mg)
2 Pulmonary Oedema diagnosis

- Heart disease (MI, Valvular)
- SOB on exertion (NYHA I – IV)
- Use of Cardiac Medications (B blockers, ACE I, Diuretics)
- White frothy sputum
- Orthopnoeoa, PND
- Raised JVP, Basal lung crepitations, peripheral oedema
Pulmonary Oedema Causes

- Acute cardiomyopathy (myocarditis, postpartum cardiomyopathy)
- Myocardial ischemia (poor LV function)
- Arrhythmia (tachy- or bradyarrhythmia)
- Valvular dysfunction (stenosis or regurgitation)
- Pericardial syndrome (tamponade, constriction)
Pulmonary Oedema CXR
ACUTE PULMONARY OEDEMA

- **Position** for comfort (usually sitting upright)*
- **Oxygen** via non-rebreathing mask*
- Use continuous positive airway pressure ventilation (CPAP) if available: otherwise consider assisting ventilations
- 400 mg **glyceryl trinitrate** spray if systolic BP > 90 mm Hg
- 12 lead **ECG**
- Give **furosemide** 40 mg IV*
- Give **morphine** 5–10 mg IV (monitor respirations and assist ventilation)
- Consider **salbutamol** 5 mg via nebuliser in the presence of wheeze*
Refractory Pulmonary Oedema

- Acute heart failure unresponsive to initial therapies, worsening renal function - **Dobutamine**: 2–20 μg/kg per min intravenously

- Shock with inadequate blood pressure –
  - **Dopamine**: 1–50 μg/kg per min intravenously
  - **Norepinephrine**: 0.01–0.4 μg/kg per min intravenously
Treatment for Heart Failure

### Drugs
- ACE I or ARB (if ACE I intolerant)
- Beta Blockers (Bisoprolol/Carvedilol/Metoprolol Succinate)
- Mineralocorticoid Receptor Antagonist (MRA eg Aldactone/Eplerenone)

### Devices
- ICD
- CRT

### Surgical Procedures
- Heart Transplantation
- CABG (Symptomatic/LMS/3VD/Viable Myocardium)

### Lifestyle Management
- Heart Failure Education
- Lifestyle Modification
- Exercise Training
3 Pneumonia diagnosis

- Flu like symptoms, cough, fever
- Green sputum
- Pleuritic chest pain
- Consolidation on examination
- Crackles / pleuritic rub
Pneumonia CXR
Pneumonia treatment

- Oxygen
- IV fluids
- Monitor for sepsis
- Positive Airways Pressure if required
- Early antibiotics (IV Augmentin, Rocephine)
4 Pneumothorax

Presentation
- Acute pleuritic pain
- Resonance to percussion of chest

Treatment
- Oxygen
- Urgent aspiration
- Chest drain
Pneumothorax
Chest Aspiration

A

B
5 Pulmonary Embolus

- Pleuritic chest pain
- Signs of DVT
- Risk factors: immobility, malignancy, thrombophilia
Pulmonary Embolus

- CTPA or VQ scan
Pulmonary Embolus

- Thrombolysis in unstable patient
- Low molecular weight heparin
- Warfarin
Conclusion

- Recognising signs of severity in the Acutely Breathless Patient
- Acute Management of Airway and Oxygen
- Diagnosis of Common Presentations
- Management of Common Conditions