Respiratory Therapy for General Surgery Residents

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Outline

• Oxygen
• Supplemental oxygen
• Increase lung volumes/FRC
• Secretion clearance
• Medications
Oxygen

• Discovered by Swedish pharmacist, Carl Wilhelm Scheele, around 1772

• Also discovered by British clergyman, Joseph Priestley, in 1774
Oxygen

- Antoine Lavoisier also claims to discover oxygen in 1774

- Oxygene: from the Greek oxys (acid) and genes (producer)
Supplemental oxygen

• Nasal cannula
  – Maximum flow rate of 6 L/min
  – Maximum FiO$_2$ of ~45%
  – Provides ~4% increase in FiO$_2$ with each liter
Supplemental oxygen

• Nasal High Flow Therapy (HFT)
  – Larger diameter tubing
  – Administer more flow and greater FiO₂
  – No mask required!
Supplemental oxygen

- Venturi mask
  - Controlled FiO₂ up to 50%
  - Used with nebulizers for humidification and medication administration
Supplemental oxygen

• Non-rebreather mask
  – Can deliver almost ~90% FiO₂
  – Bag should deflate to 60% full
Increase lung volume

• Incentive spirometry
  – Mimics natural sighing or yawning
  – Atelectasis prevented and reversed

No evidence regarding the effectiveness of the use of incentive spirometry for prevention of postoperative pulmonary complications in upper abdominal surgery.
Increase lung volume

• IPPB: intermittent positive pressure breathing
  – Delivers positive pressure during inspiration only
  – Useful when patients fail or are unable to use IS
Contraindications to IPPB

- Closed head injury
- Increased ICP
- Facial injuries
- TB
- s/p gastric bypass
The results suggest that face-mask PEEP will increase functional residual capacity, that incentive spirometry has little or no effect, and that IPPB may decrease lung volume after treatment.

Secretion clearance

• Acapella
  – Exhaling slowly against resistance stents airways open and clears secretions
Secretion clearance

• CPPD: chest percussion and postural drainage
  – ICU: bed percussion
  – Floor: pneumatic percussion

Fluid Flo 2900
Secretion clearance

• IPV: intrapulmonary percussive ventilation
  – Percussive bursts of gas (100-300 per minute) are delivered throughout the respiratory cycle which loosen and mobilize secretions

There was no clear evidence that oscillation was a more or less effective intervention overall than other forms of physiotherapy.
Medications

• Bronchodilators: $\beta$-agonists, anticholinergics

• Mucolytics: Mucomyst, Pulmozyme
  – Usually given with a bronchodilator
  – Do NOT use Pulmozyme with IPV