RSPT 1410
Lung Expansion Therapy
Part 3: Intermittent Positive Pressure Breathing (IPPB)

Wilkins: Chapter 39; p. 909-915
Cairo: Chapter 7, p. 217-230

IPPB

• Introduced in 1947
• Has gone through good times and bad - from overuse to judicious use
• Defined as the application of inspiratory positive pressure to a spontaneously breathing patient as an intermittent or short-term therapeutic modality - it should not be considered as a means of prolonged or continuous ventilatory support

IPPB

• Increases P_L and lung volume by increasing alveolar pressure
• Uses devices that provide a driving force to produce increased pressure
• Should be limited to specifically selected patients with specific need for positive pressure breathing
IPPB

- Proper use requires that
  - patients be carefully chosen
  - indications for therapy be specifically defined
  - goals of therapy be clearly understood
  - the treatment be properly administered and monitored by trained RCPs

IPPB

- Physiologic effects
  - reverses the normal intrathoracic and intrapulmonary pressure relationship
  - increases transpulmonary pressure gradient
  - decreases __________
  - increases __________
  - secretions are more effectively mobilized
  - may increase ________
  - may decrease __________
  - These effects last only for the duration of the treatment

IPPB

- Assessment of need
  - presence of
  - reduced pulmonary function as evidenced by reductions in timed volumes, and vital capacity (e.g., FEV₁ < 65% predicted, FVC < 70% predicted, MVV < 50% predicted, or VC < 10 ml/kg) precluding an effective cough
  - neuromuscular disorders or kyphoscoliosis with associated __________ in lung volumes and capacities
IPPB

- Assessment of need
  - fatigue or muscle weakness with impending
  - presence of acute severe bronchospasm or exacerbated COPD that fails to respond to other therapy
  - regardless of the type of delivery device used (MDI with spacer or small volume, large-volume, or ultrasonic nebulizer), it is important to recognize that the dose of the drug needs to be titrated to give the maximum benefit

IPPB

- Assessment of need
  - based on proven therapeutic efficacy, variety of medications, and cost-effectiveness, the MDI with accessory device should be the first method to consider for administration of aerosol
  - with demonstrated effectiveness, the patient's preference for a positive pressure device should be honored

IPPB

- Indications
  - the need to improve
    - the presence of clinically important pulmonary when other forms of therapy have been unsuccessful (incentive spirometry, chest physiotherapy, deep breathing exercises, positive airway pressure) or the patient cannot cooperate
    - inability to adequately because of pathology that severely limits the ability to ventilate or cough effectively and failure to respond to other modes of treatment
IPPB

- Indications
  - the need for short-term ventilatory support for patients who are ____________ as an alternative to tracheal intubation and continuous ventilatory support
  - the need to deliver _______________________
    (We are not addressing aerosol delivery for patients on long-term mechanical ventilation)

IPPB

- Indications
  - although some oppose the use of IPPB in the treatment of severe bronchospasm (acute asthma, unstable or status asthmaticus, exacerbated COPD), the AARC recommends a careful, closely supervised trial of IPPB when treatment using other techniques (metered dose inhaler [MDI] or nebulizer) has been unsuccessful

IPPB

- Indications
  - IPPB may be used to deliver aerosol medications to patients with fatigue as a result of ventilatory muscle weakness (eg, failure to wean from mechanical ventilation, neuromuscular disease, kyphoscoliosis) or chronic conditions in which intermittent ventilatory support is indicated (eg, ventilatory support for home care patients and the more recent use of nasal IPPV for respiratory insufficiency)
IPPB

• Absolute contraindications
  – untreated tension pneumothorax

• Relative contraindications
  – patients with any of the following should be carefully evaluated before initiating IPPB
    • intracranial pressure (ICP) >_______ mm Hg
    • hemodynamic instability
    • recent facial, oral, or skull surgery
    • tracheoesophageal fistula
    • recent esophageal surgery
    • active__________

• Relative contraindications
  – patients with any of the following should be carefully evaluated before initiating IPPB
    • nausea
    • air swallowing
    • active untreated______________
    • radiographic evidence of bleb
    • singulation (_______________)
IPPB

• Relative contraindications
  – availability of a simpler, more economical, yet equally effective therapy

IPPB

• Hazards/complications
  – increased ___________
  – barotrauma, pneumothorax
  – nosocomial infection
  – hemoptysis
  – hyperoxia when oxygen is the gas source
  – gastric ___________

IPPB

• Hazards/complications
  – impaction of secretions (associated with inadequately humidified gas mixture)
  – psychological dependence
  – impedance ___________
  – exacerbation of hypoxemia
  – hypoventilation
  – increased mismatch of ventilation and perfusion
  – air trapping, auto-PEEP, ___________
alveoli
IPPB

- Assessment of outcome
  - tidal volume during IPPB greater than during spontaneous breathing (by at least 25%)
  - FEV₁ or peak flow ________________
  - cough more ________________ with treatment
  - secretion clearance enhanced as a consequence of deep breathing and coughing
  - chest x-ray ________________
  - breath sounds ________________
  - favorable patient subjective response