Disclosure

I have no actual or potential conflict of interest in relation to this program/presentation.

Learning Objectives

- Define postoperative pulmonary complications (PPCs)
- Identify patient- and procedure-related risk factors for PPCs
- Outline the preoperative pulmonary risk assessment
- Assess postoperative pulmonary risk
- Examine evidence-based strategies to reduce PPCs
Postoperative Pulmonary Complications (PPCs)

- Important source of perioperative morbidity & mortality
- PPCs occur at a rate of 6.8% across all types of surgery
- More costly & longer length of stays than other major postoperative complications
- Estimating PPCs should be a standard preoperative assessment

Postoperative Pulmonary Complications (PPCs)

Definition

- Postoperative pulmonary abnormality that produces identifiable disease or dysfunction that is clinical significant and adversely affects the clinical course

Perioperative Pulmonary Physiologic Changes

- An extension of normal physiologic changes
  - Reduced lung volumes
    - Diaphragmatic dysfunction
  - Reduced vital capacity
  - Reduced functional residual capacity
  - Depressed respiratory drive
  - Inhibition of cough
  - Impaired mucociliary clearance
Major Categories of PPCs
- Atelectasis
- Bronchospasm
- Acute respiratory failure
  - Reintubation & prolonged mechanical ventilation
- Infection
  - Bronchitis & pneumonia
- Exacerbation of chronic lung disease (COPD or asthma)

Patient-Related Risk Factors for PPCs

Definite
- Advanced age
- Poor general health status
- CHF
- COPD
- Functional dependence

 Likely or Possible
- Cigarette use
- Obstructive sleep apnea
- Pulmonary hypertension
- Upper respiratory infection
- Metabolic & nutritional factors
Procedure-Related Risk Factors for PPCs

**Definite**
- Surgical site
- Duration of surgery
- Emergent surgery
- Type of neuromuscular blockade

**Likely or Possible**
- Type of anesthesia

Preoperative Pulmonary Risk Assessment

**History & Physical Examination**
- Identify aforementioned risk factors
- Elicit unrecognized chronic lung disease or heart failure
- Evidence of obstructive lung disease
  - Decreased breath sounds
  - Adventitious sounds
  - Prolonged expiratory phase

**Preoperative Testing**
- Pulmonary function testing (PFTs)
- Cardiopulmonary exercise testing (CPET)
- Chest radiography (CXR)
Risk Prediction Tools for PPCs

- ARISCAT Risk Index
- Gupta Calculator for Postoperative Respiratory Failure
- Gupta Calculator for Postoperative Pneumonia
- Arozullah Respiratory Failure Index
- ACS NSQIP Surgical Risk Calculator

Risk Reduction Strategies for PPCs

**Preoperative**

- Smoking cessation
- Optimize control of chronic lung disease
- Lung expansion strategies
- Patient education

**Intraoperative**

- Type of anesthesia/neuromuscular blockade
- Duration of surgery
- Type of surgery
Risk Reduction Strategies for PPCs

Postoperative
- Lung expansion strategies
- Appropriate postoperative pain control
- Selective use of nasogastric decompression