

# ATELECTASIS

*(Last updated 7/22/2019 Reviewed by: Jalal Soleimani MD)*

**PRESENTING COMPLAINT:** Difficulty breathing, coughing

## FINDINGS

- **A** Check airway
- **B** ↑RR, rapid and shallow breathing, wheezing, decreased or absent breath sounds
- **C** ↓BP, ↑HR, weak pulse (late sign – prompts immediate action),
- **D** Variable altered (V,P,U,D)\*
- **E** Cyanosis, fever
- **L<sub>PC</sub>** ↓PaO<sub>2</sub>, ↑PCO<sub>2</sub>, ABG for hypoxemia, pulse oximetry (↓SpO<sub>2</sub>)
- **U<sub>PC</sub>** Pattern of consolidation (solid and hyperechoic structure)

\***V** (verbal), **P** (pain), **U** (unconsciousness), **D** (delirious)

**U<sub>PC</sub>** (point of care ultrasound) **L<sub>PC</sub>** (point of care labs)

## TYPES OF ATELECTASIS

- **Obstructive:** Due to blockage of airway by mass, secretions/mucus plug, etc.
- **Non Obstructive:** Due to inadequate respiratory excursion and cough, effusion, pneumothorax, bullae, immobility, poor relaxation/ inspiratory effort
- **Compressive:** Due to distended abdomen or space occupying lesion in thorax
  - Adhesive: loss of surfactant function, e.g. ARDS
  - Cicatrization: parenchymal scarring

## OTHER HISTORY

- Often asymptomatic; Unexplained hypoxemia, tachypnea, fever, persistent coughing and shortness of breath not attributable to other causes, tachycardia, decreased or absent breath sounds
- **Predisposing conditions:** Post-operative state, pain, rib fracture, pneumothorax, scoliosis, neuromuscular weakness, smoking, endobronchial neoplasm, chronic bronchitis, pulmonary infections, mucous plugs, obesity, abdominal distension

## DIFFERENTIAL DIAGNOSES

- Pneumonia, contusion, cardiogenic pulmonary edema, ARDS, scarring/fibrosis, neoplasm

## OTHER INVESTIGATIONS

- **Monitor** pulse oximetry

- **Imaging**

- Chest X-ray: often sufficient for lobar/whole lung atelectasis
- Ultrasound: pattern of consolidation, useful point of care tool in detecting atelectasis (depends on the expertise of the operator)
- CT chest: most sensitive/specific for identifying type and etiology of atelectasis

## **THERAPEUTIC INTERVENTIONS**

### **General**

- Sit up as tolerated (reverse Trendelenburg position)
- Encourage deep breaths: Incentive spirometry, early mobilization, optimize analgesia (especially if pain inhibits respiration)
- If hypoxemic, high flow O<sub>2</sub> via nasal cannula or noninvasive ventilation
- If mechanically ventilated, use/increase PEEP
- **Specific to etiology**
  - Obstructive lung disease: bronchodilator
  - Mucus plug/excessive secretions
    - Nebulized mucolytic, like N-acetylcysteine or hypertonic saline, can help with excess secretion
    - Chest PT and vibration, nasotracheal suctioning, consider bronchoscopy (usually not necessary in the absence of foreign body/mass)
  - Pleural effusion/ pneumothorax: thoracostomy and thoracentesis
  - Abdominal distension: NGT decompression, reverse Trendelenburg position, CPAP/PEEP

## **ONGOING TREATMENT**

- **Follow-Up:** Repeating chest x-ray is not necessary, but may help to confirm resolution or worsening of atelectasis
- **Prophylaxis:** Incentive spirometry (Useful strategy to prevent postoperative atelectasis. This works best when started preoperatively), elevated head of bed/reverse Trendelenburg position, early mobilization

## **CAUTIONS**

- **Complications:** Pneumonia (prolonged atelectasis with ineffective secretion clearance increases the risk), ARDS (bilateral atelectasis)

## **REFERENCES & ACKNOWLEDGMENTS**

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