

## M03: Pediatrics - Respiratory Emergencies

Wes Bihlmayr

Updated: December 21, 2020

Reviewed:

### Introduction

Respiratory conditions in children can be categorized into upper airway obstructions, lower airway obstructions, lower airway restrictive pathology, and disordered control of breathing.

Upper airway obstructions occur when there is an increased work of breathing due to an obstruction above the thorax. This can consist of a foreign body, tissue swelling, subglottic stenosis from previous intubation trauma, and the development of a tumour. Lower airway obstructions, by contrast, result from obstructive problems below the thorax: foreign bodies, or bronchial swelling or constriction.

Restrictions in the lower airways are a result of "stiffening" of lung tissue, caused by increased fluid accumulation from pulmonary edema, toxic exposure, allergic reactions, infiltration, and inflammation. Abdominal structures can also push on lung tissue, creating a restrictive condition.

Dysfunction within the respiratory center of the brain is responsible for the development of disordered breathing. These are more properly neurological problems with respiratory effects, and can include problems such as increased intracranial pressure, neuromuscular disease, and some poisonings and overdoses.

### Essentials

- Upper airway obstruction can be an uncomfortable call to attend as the majority of patients may look ill but require just comfort levels for treatment.
  - See → [B04: Croup and Epiglottitis](#) for additional information on the management of upper airway obstructions.
- Lower airway obstruction results in an inability for the patient to get air out of the chest. This is usually due to excessive swelling of bronchospasm.
- Lower airway restrictive pathologies consist of numerous conditions that result in decreasing lung compliance or stiffening of the lung. The general management of these conditions concern correcting oxygenation and ventilation utilizing an escalation pathway of increasing FiO<sub>2</sub> via nasal cannula, face mask, heated HiFlow nasal cannula (2 lpm/kg to a max of 60 lpm), NIV therapy and then intubation. Bronchospasm can be treated with a B<sub>2</sub> agonist.
- Disordered Control of Breathing are a series of conditions affecting the respiratory control center in the brain or neuromuscular diseases.

### General Information

- Continuous salbutamol can decrease serum potassium
- Ventilating the lower airway restrictive disease patient may require high peak inspired pressure of up to 32 cmH<sub>2</sub>O and high PEEP of up to 10-15 cmH<sub>2</sub>O. Diligent monitoring for the development of a pneumothorax is required.
- Succinylcholine should be avoided in the patient with neuromuscular disease due to the possibility of triggering hyperkalemia or malignant hyperthermia

### Interventions

#### First Responder

- Prevent heat loss but do not overheat the patient.
- Provide supplemental oxygen as required
  - → [A07: Oxygen and Medication Administration](#)
- Manual airway maneuvers as required
  - → [B01: Airway Management](#)

- Positive pressure ventilation with BVM
  - → [B01: Airway Management](#)

#### Emergency Medical Responder – All FR interventions, plus:

- Provide supplemental oxygen to maintain SpO<sub>2</sub> ≥ 94%
  - → [A07: Oxygen and Medication Administration](#)
- Transport with notification
- Consider ACP intercept

#### Primary Care Paramedic – All FR and EMR interventions, plus:

- Consider vascular access and fluid administration
  - → [D03: Vascular Access](#)
- Consider supraglottic airway to maintain airway patency
  - → [PR08: Supraglottic Airway](#)
- For bronchospasm, reactive airway disease, and asthma:
  - [Salbutamol](#)
  - Consider intramuscular [EPINEPHrine](#)
  - See → [B03: Asthma and Bronchospasm](#) for additional information.
- For croup, epiglottitis, and stridor:
  - Consider nebulized or intramuscular [EPINEPHrine](#)
  - See → [B04: Croup and Epiglottitis](#) for additional information.

#### Advanced Care Paramedic – All FR, EMR, and PCP interventions, plus:

- Consider addition of [ipratropium](#) to supplement salbutamol.
- Consider [magnesium sulfate](#) for significant and protracted bronchospasm.
- Consider intraosseous cannulation if peripheral access is unavailable.
  - → [PR12: Intraosseous Cannulation](#)
- Consider procedural sedation to facilitate airway management.
  - → [PR17: Procedural Sedation](#)
- Consider intubation in patients whose airways cannot be managed through less invasive means:
  - → [PR18: Anesthesia Induction](#)
- Decompress suspected tension pneumothorax
  - → [PR21: Needle Thoracentesis](#)

#### Critical Care Paramedic – All FR, EMR, PCP, and ACP interventions, plus:

- Mechanical ventilation (NIV and invasive)
- Chest tube maintenance
- Osmotic agents
- 3% Saline
- Infusion medication
- Antibiotic therapy
- Steroid therapy
- Nonselective adenosine receptor antagonist and phosphodiesterase inhibitor

## References

[Pediatric Wheeze/Bronchospasm](#)

[Pediatric Stridor](#)

