

SFA
 FMR
 EMR
 PCP

Standard Approach and Ongoing Assessment

SFA
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Consider assisting patient with own salbutamol and/or ipratropium bromide

PCP

Establish vascular access

PCP

Less than 20 kg:
salbutamol 1 puff MDI with spacer every 30-60 seconds prn to a maximum of 15 puffs
ipratropium bromide 1 puff MDI with spacer every 30-60 seconds prn to a maximum of 12 puffs

Greater than or equal to 20 kg:
salbutamol 1 puff MDI with spacer every 30-60 seconds prn to a maximum of 30 puffs
ipratropium bromide 1 puff MDI with spacer every 30-60 seconds prn to a maximum of 15 puffs

Condition improved?

No

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Refer to MFR Dispatch and Communication Process for OLMC contact

Yes

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Continue treatment and assessment until transfer of care to EMS

Infection Prevention and Control (IP&C) Considerations

- N95 respirator is mandatory with any Aerosol Generating Medical Procedure (AGMP)

Etiology

Bronchospasm is an abnormal contraction of the smooth muscle of the bronchi, resulting in an acute narrowing and obstruction of the lower airway. A cough with generalized wheezing usually indicates this condition. Wheezing is produced by the movement of air through constricted airways. It is critical to recognize there may be little or no air flow in severe bronchospasm attacks with the result being minimal audible wheezing. In cases of severe bronchospasm, audible wheezing may be absent prior to treatment. In these cases, the onset of wheezing following treatment may be indicative of improved airflow.

Patients (especially children) with inspiratory stridor are more likely to have a partial upper airway obstruction (i.e. croup, epiglottitis, foreign body). Audible wheezing on inspiration is likely referred upper airway noise from stridor.

Practitioners must consider other causes of bronchospasm such as CHF, toxic inhalation and pneumonia. OLMC should occur early if the diagnosis is uncertain. Asthma or COPD may present as a “silent chest”. Remember, **“All that wheezes is not asthma”**

Signs of Increased Respiratory Effort

	Mild	Moderate	Severe	Near Death
Wheeze	<ul style="list-style-type: none"> • Expiratory • Low pitched 	<ul style="list-style-type: none"> • Expiratory & inspiratory • High pitched 	<ul style="list-style-type: none"> • Distant • Near absent 	<ul style="list-style-type: none"> • Absent • Work of breathing compromised • Silent chest
Speech	<ul style="list-style-type: none"> • Full sentences 	<ul style="list-style-type: none"> • Partial sentences 	<ul style="list-style-type: none"> • Single words • Difficulty speaking 	<ul style="list-style-type: none"> • Not responding
Respiratory Rate & Effort	<ul style="list-style-type: none"> • Normal to slight tachypnea 	<ul style="list-style-type: none"> • SOB at rest • Congested • Chest tightness 	<ul style="list-style-type: none"> • Laboured 	<ul style="list-style-type: none"> • Slowing • Apnea
Mentation	<ul style="list-style-type: none"> • Normal 	<ul style="list-style-type: none"> • Normal • Distracted 	<ul style="list-style-type: none"> • Distracted • Becoming disoriented 	<ul style="list-style-type: none"> • Exhausted • Confused

Asthma

1. Asthma is a reversible obstructive lung disease characterized by:
 - a. Bronchial smooth muscle contraction
 - b. Mucosal and submucosal inflammation and edema
 - c. Increased mucous production and congested airways

2. Asthma may be triggered by extrinsic factors (e.g. pollution, exercise, cold air, pharmacological products) or intrinsic factors (e.g. allergies)

Pneumonia

1. Pneumonia is a breathing (respiratory) condition in which there is an infection of the lung
2. The most common symptoms of pneumonia are:
 - a. Cough (may be productive – greenish/yellow mucus, or even bloody mucus)
 - b. Fever
 - c. Shaking / chills
 - d. Shortness of breath
3. In the setting of suspected or known pneumonia or sepsis, **do not** administer steroids (dexamethasone or predniSONE)

Pediatric Considerations

Not applicable

Interventions**Ventilation**

1. Respiratory failure can consist of hypoxia, hypercapnia (elevated CO₂) or both; in most patients with respiratory failure the goal is to treat the 2 conditions simultaneously
2. In the critically ill asthmatic, however, the primary treatment goal is to correct hypoxia rather than hypercapnia because assisted mechanical ventilation in an asthmatic is associated with a high risk of barotrauma (pneumothorax); excessive ventilation (by rate or volume) can induce pneumothorax which is significantly more serious than hypercapnia in a patient with reasonable oxygenation
3. The primary treatment goal in the critically ill asthmatic patient is to ventilate to an O₂ saturation of 90% using as low a ventilatory rate and volume as possible; the oxygen saturation level rather than the CO₂ level ultimately determines the rate and volume of assisted ventilation; this concept is known as “permissive hypercapnia”
4. Oxygen saturations of 88 – 90% are completely compatible with life and aggressive attempts to improve oxygen saturation with high ventilatory volumes and pressures are dangerous due to the risk of barotraumas

5. Positive end expiratory pressure (PEEP) should not be applied
 - a. Due to incomplete expiration caused by bronchoconstriction, “air trapping” and “breath stacking” occurs (i.e. the lungs are incompletely emptied before the next breath is in)
 - b. This leads to increased pressures in the airways (“auto PEEP”); the increased intrathoracic pressure from auto PEEP may reduce venous return to the heart, and hence reduce cardiac output and blood pressure levels; the increased intrathoracic pressure may also lead to barotraumas such as tension pneumothorax

Airway Management

1. Early and aggressive supportive care may decrease the need for advanced airway placement

Infection Prevention and Control (IP&C) Considerations

Many Therapies for respiratory conditions and airway management techniques are known as aerosol generating medical procedures (AGMPs). These often produce splashes of oral secretions, as well as blood, and emesis when they are present. In the presence of an infectious state, oral secretion can transmit harmful pathogens. Personal protective equipment (PPE) that protects the pre-hospital care provider's eyes, nose and mouth as a minimum is mandatory.

Appropriate PPE must be worn while caring for all suspected ILI patients. Refer to AHS Interim Guidance for PPE requirements.

AGMPs should be avoided when possible, and only performed in consultation with OLMC. Common AGMPs Performed by pre-hospital care providers:

- Airway management e.g. intubation or BVM ventilation
- Suctioning
- Nebulization of medication
- CPAP

The patient should wear a procedure mask, if tolerated. Oxygen can be administered while the patient is wearing the procedure mask via a nasal cannula. If the patient requires additional oxygen, a NRB can be used without the accompanying procedure mask

Pre-notification of the receiving facility is mandatory and must be done as soon as possible