1. **PRACTICE OUTCOME**
   To identify an asthma attack in the primary care setting and to provide an emergency response based on best available evidence.

2. **DEFINITIONS**
   Asthma is defined as a respiratory disorder characterized by paroxysmal or persistent symptoms, such as dyspnea, chest tightness, wheezing, sputum production and cough associated with variable airflow limitation and airway hyperresponsiveness to endogenous or exogenous stimuli. Inflammation and its resultant effects on airway structure are considered the main mechanisms leading to the development and persistence of asthma.\(^1\)

   Asthma symptoms and attacks (i.e. episodes of more severe shortness of breath) usually occur after exposure to "triggers." Some of the common triggers are allergens, viral respiratory infections (e.g. a cold), exercise, or exposure to irritant fumes or gases.\(^2\)

3. **GUIDELINES**
   3.1. **Assessment**
      3.1.1. **Onset:** sudden onset with rapid progression of symptoms
      3.1.2. **Usual Causes:**
         - **Indoor allergens** - exposure to house dust (domestic mites), animal dander (pets), cockroach allergen, and fungi
         - **Outdoor allergens** - pollens and fungi, irritant fumes or gases
         - **Occupational sensitizers** - exposure to work-related agents
         - **Viral respiratory infections**
         - **Exercise.**
         Triggers include additional exposures to causal factors that have already sensitized a person’s airways, such as allergens, respiratory infections, exercise and hyperventilation, weather changes, outdoor and indoor pollutants, foods, additives, and drugs.
      3.1.3. **Signs and symptoms:**
         - **SIGNS**
           - difficulty speaking
           - may have central cyanosis
           - may be agitated
           - elevated pulse rate
           - physical exhaustion
           - wheezing or silent chest with no air entry and no wheezing.
         - **SYMPTOMS**
           - Chest tightness
           - Coughing
           - Shortness of Breath

<table>
<thead>
<tr>
<th>Initial Assessment of Severity of Acute Asthma In Adults &amp; Children(^3)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SYMPTOMS</strong></td>
</tr>
<tr>
<td>Talks in:</td>
</tr>
</tbody>
</table>
### Physical Examination

<table>
<thead>
<tr>
<th>Physical Feature</th>
<th>No</th>
<th>No</th>
<th>Yes. Also may have paradoxical chest wall movement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accessory Muscle Use/Recession</td>
<td>No</td>
<td>Minimal</td>
<td>Moderate</td>
</tr>
<tr>
<td>Pulse Rate</td>
<td>&lt; 100/min</td>
<td>100-120/min</td>
<td>&gt; 120/min; less than 60/min*</td>
</tr>
<tr>
<td>Level of Consciousness</td>
<td>Normal</td>
<td>May be agitated</td>
<td>Confused, drowsy or agitated</td>
</tr>
<tr>
<td>Wheeze Intensity</td>
<td>Variable</td>
<td>Moderate – loud</td>
<td>Often quiet</td>
</tr>
<tr>
<td>Central Cyanosis</td>
<td>Absent</td>
<td>May be present</td>
<td>Likely to be present</td>
</tr>
<tr>
<td>Oximetry</td>
<td>&gt; 94%</td>
<td>90 – 94%</td>
<td>&lt; 90%; cyanosis may be present</td>
</tr>
</tbody>
</table>

*Bradycardia may be seen when respiratory arrest is imminent

#### 3.2. Intervention

3.2.1. Assess severity of asthma and treat (see Section 5 Quick Reference Sheet).
3.2.2. Follow WRHA General Emergency Protocol for Primary Care Settings.
3.2.3. Activate 911 if:
   - client does not respond to treatment within 10 – 15 minutes, or
   - client demonstrates clinical signs of progressing deterioration, or
   - client loses consciousness.
3.2.4. Consult with physician or RNEP for medication adjustment as required post event.
   Consider referral to regional asthma education centers
3.2.5. Document the event, including physical assessment, interventions and client's response to treatment.

#### 4. Equipment/Supplies Required

- Oxygen
- Adult and Pediatric AeroChamber with Mask
- Adult and Pediatric Non-rebreather masks
- Nasal Cannula
- Extra Oxygen tubing
- Salbutamol 100 microgram/puff
- Ipratropium bromide 20 microgram/puff
- Prednisone: oral tablets 50 milligram and liquid preparation 1 milligram/milliliter
- Adrenaline for anaphylactic reactions as per anaphylaxis protocol
- Optional: Pulse Oximeter
### 5. RESOURCES / QUICK REFERENCE SHEET

<table>
<thead>
<tr>
<th>TREATMENT</th>
<th>MILD ATTACK</th>
<th>MODERATE ATTACK</th>
<th>SEVERE ATTACK</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oxygen</td>
<td>High flow of at least 8 L/minute, titrated to maintain O2 saturation 92 - 95%. Monitor effect by oximetry, if available. <strong>Will not suppress respiratory drive in acute asthma</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>β2 –agonist per MDI and spacer</td>
<td>Adult: Salbutamol 100 microgram/puff MDI 4 – 8 puffs every 15 – 20 minutes X 3</td>
<td>Adult: Salbutamol 100 microgram/puff Increase to 1 puff every 30 – 60 seconds</td>
<td>Pediatric: Salbutamol 100 microgram/puff. MDI 0.3 puffs/kg. Increase to 1 puff every 30 – 60 seconds.</td>
</tr>
<tr>
<td></td>
<td>Pediatric: Salbutamol 100 microgram/puff MDI 0.3 puffs/kg (max 10 puffs). Pause 30 seconds between puffs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Systemic Corticosteroids</td>
<td>Likely not necessary</td>
<td>Adult: Prednisone PO 50 mg tablet</td>
<td>Adult: Prednisone PO 50 mg tablet</td>
</tr>
<tr>
<td></td>
<td>Pediatric: Prednisone PO (liquid) 1-2mg/kg</td>
<td></td>
<td>Pediatric: Prednisone PO (liquid) 1-2mg/kg</td>
</tr>
<tr>
<td>Anticholinergics</td>
<td>Should be reserved for patients not responding to β2 –agonists or with severe symptoms</td>
<td></td>
<td>Adult: ipratropium bromide 20 microgram/puff MDI 4-8 puffs every 15-20 min X 3 is usual. Increase to 1 puff every 30-60 sec (4-20 puffs) pm</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Pediatric: Ipratropium bromide 20 microgram/puff MDI 3-6 puffs every 20-120 min</td>
</tr>
</tbody>
</table>

### 6. SOURCE /REFERENCES


7. PRIMARY AUTHOR
7.1 Rebecca Neto, Program Specialist – WRHA Primary Care Program
7.2 Dr. Sheldon Permack, Medical Director, WRHA Primary Care Program

8. ALTERNATE CONTACT
Margaret Kozłowski, Director – WRHA Family Medicine/Primary Care Services

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