Adult Emergency Department Asthma Care Pathway (EDACP)
March 2013

Contact Information

Email: edacp@on.lung.ca

Phone: 416-864-9911/888-344-5864(toll-free) extension 270

Fax: 416-922-9430
# Adult Emergency Department Asthma Care Pathway

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instructions</td>
<td>3</td>
</tr>
<tr>
<td>Medication Guidelines</td>
<td>4</td>
</tr>
<tr>
<td>Physician’s Orders – Mild, Moderate, Severe Asthma</td>
<td>5</td>
</tr>
<tr>
<td>Physician’s Orders – Potentially Life Threatening Asthma</td>
<td>6</td>
</tr>
<tr>
<td>Patient Discharge Instructions</td>
<td>7</td>
</tr>
<tr>
<td>Patient Education Checklist</td>
<td>9</td>
</tr>
<tr>
<td>Medical Directive</td>
<td>10</td>
</tr>
<tr>
<td>References</td>
<td>14</td>
</tr>
</tbody>
</table>
EMERGENCY DEPARTMENT
ASTHMA CARE PATHWAY
ADULT: 16 years and over

Indications: Age 16 years or older with one of the following: history of asthma; or previous episode of wheezing requiring treatment; or asthma and pregnancy; or COPD with asthma

Contraindications: COPD without asthma; or CHF; or ED visit for prescription refill only

**Introduction**

1. This is a proactive tool that provides considerations for asthma management based on Canadian Association of Emergency Physicians’ (CAEP) Asthma Guidelines (1996), the Canadian Asthma Consensus Guidelines (2012) and other evidence from subsequent publications.
2. This pathway should be attached to the hospital’s standard triage form once inclusion criteria are met.

**ED Adult Asthma - Quality Assurance Guidelines:**

**CTAS Level 3:** Nurse Assessment: less than 30 minutes; 1st Bronchodilator: less than 30 minutes; MD Assessment: less than 30 minutes

**CTAS Level 2:** Nurse Assessment: immediate; 1st Bronchodilator: less than 10 minutes; MD Assessment: less than 15 minutes

**CTAS Level 1:** Nurse Assessment: immediate; 1st Bronchodilator: immediate; MD Assessment: immediate

*Canadian Triage and Acuity Scale (CTAS) “Times to Assessment” are operating objectives, not standards of care. Facilities without on-site physician coverage may meet assessment objectives using delegated protocols and remote communication.*

**Disclaimer:**

This Clinical Pathway is not intended to set the standard of care applicable in any particular clinical situation. It is merely prepared as a guide to assist physicians, nurses, respiratory therapists and other healthcare providers, in deciding on the appropriate care required for a particular patient. At all times, physicians, nurses, respiratory therapists and other healthcare providers must exercise their independent clinical judgment, based on their knowledge, training and experience, taking into account the specific facts and circumstances of each patient, when deciding on the appropriate course of investigation and/or treatment to recommend in a particular clinical situation. Any reference throughout the document to specific pharmaceutical products as examples does not imply endorsement of any of these products.

**INSTRUCTIONS:**

1. **Triage** to determine patient eligibility for clinical pathway.
2. **Nurse/RT** to begin Adult ED Asthma Care Pathway Medical Directive OR **Physician** to choose order set according to asthma severity (page 1 or 2 of “Physician’s Orders”)
3. Refer to medication guidelines on reverse of physician orders for more information.
4. **Physician/Nurse Practitioner** to fill out and sign “Discharge Instructions”
5. **Physician/Nurse/RT** to review “Education Checklist” and “Discharge Instructions” with patient

This care pathway was developed with input from and has been endorsed by:

[Logos of various healthcare organizations]
Medication Guidelines for Emergency Management of Adult Asthma

**STANDARD EMERGENCY DEPARTMENT TREATMENT**
Supplemental oxygen to keep SpO₂ 92% or more

**Bronchodilators**
- **beta₂-agonist** (inhaled salbutamol); first line therapy – titrate to response
  - MDI + spacer (100 mcg/puff); 4–8 puffs q 15–20 min, 3 times is usual; for FEV₁ or PEF less than 40%, consider increasing to 1 puff q 30–60 sec (4–20 puffs) PRN (within patient’s tolerability); OR
  - nebulizer (5 mg/mL solution): 5 mg q 15–20 min 3 times is usual, continuous if necessary

**anticholinergic** (inhaled ipratropium bromide); additional bronchodilator
  - MDI + spacer (20 mcg/puff); 4–8 puffs q 15–20 min 3 times is usual; consider increasing to 1 puff q 30–60 sec (4–20 puffs) PRN; OR
  - nebulizer (250 mcg/mL solution): 250–500 mcg q 15–20 min 3 times is usual, continuous if necessary

**Notes**
- for nebulizer: salbutamol and ipratropium bromide may be mixed together in the doses above; adjust the volume of 0.9% sodium chloride for a minimum volume of 3–4 mL; unit dose vials (nebules) also available; administer with oxygen if SpO₂ less than 92%
- decrease frequency of bronchodilators in recovery phase
- increase dose of bronchodilators with intubated patients

**Corticosteroid**
- **Prednisone**: 50 mg tablet PO once
- **methylprednisolone**: 40–125 mg IV x 1 dose, as bolus. Available in vials of 40 mg and 125 mg; reconstitute just prior to use. May dilute in 50 mL DSW or 0.9% sodium chloride and infuse just over 15–30 minutes; OR if methylprednisolone not available (or patient allergic to it):
  - **hydrocortisone**: 250–500 mg IVx 1 dose; dilute in 50-100 mL of DSW or 0.9% sodium chloride and give over 15–30 minutes

**DISCHARGE MEDICATIONS**
All patients should be advised to follow up with their health care provider to review reasons for loss of asthma control. If adherence to controller therapy and inhaler technique is adequate, an increase in ICS dose or additional therapy (LABA or LTRA) may be appropriate.

**Short-acting beta₂ agonist** (e.g. inhaled salbutamol)
- Regular use is often needed for first 48 hours after discharge
- **First 48 hours post discharge**: recommend salbutamol 2–4 puffs QID and 4qH PRN; after 48 hrs: recommend PRN, up to 4qH
- Advise patient to go to ED if relief from beta₂-agonist lasting < 2hrs; AND to call MD if beta₂-agonist is needed more frequently than q4H

**Corticosteroid**
- **Prednisone**: 30–80 mg/day PO for 7–10 days; taper not necessary; AND
- **Inhaled Corticosteroid (ICS)**: Ensure patient is prescribed at least a medium dose of ICS, even if taking prednisone – see table below.

**NON-STANDARD TREATMENT (PATIENT IN EXTREMIS)**
High-flow oxygen to keep SpO₂ 92% or more

**salbutamol infusion** (IV solution only)
- Load: 4 mcg/kg (over 2–5 minutes)
- IV Infusion: 0.1–0.2 mcg/kg/minute

**magnesium sulfate** (IV)
- 2 g (4 mL of 0.5 g/mL) in 100 mL D5W over 20 minutes, once

**epinephrine** (IM or IV)
- IM: 0.3–0.5 mg (= 0.3 – 0.5 mL of 1:1,000 solution) q 20 min PRN; OR
- IV single dose: 0.1 mg IV over 5–10 min via injection or mini-bag; may repeat q 5–15 min PRN
  - **ampoule**: dilute 1 mL of 1:1,000 solution in 9 mL 0.9% sodium chloride (=1:10,000 dilution), give 1 mL (= 0.1 mg) IV over 5–10 min; OR
  - **pre-filled syringe**: give 1 mL of 1:1,000 solution (= 0.1 mg) over 5–10 minutes;

**OR**
- **IV infusion**: dilute 4 mL of 1:1,000 solution (1 mg/mL) in 250 mL of D5W (= 16 mcg/mL) and infuse at 1–4 mcg/min (= 1–4 mL/hr)

**methylxanthine** (e.g. aminophylline): *not recommended in first 4 hours*
- Load: 6 mg/kg IV over 30 minutes (reduce by 50% if already by theophylline or amrinone)
- Infusion: 0.2–1 mg/kg/hour (follow levels)

**Rapid Sequence Intubation**
Consult a physician experienced in this procedure, when available.

**Induction**
- **ketamine**: 1.5 mg/kg IV (some patients may require 2–3 mg); OR
- **propofol**: 2–2.5 mg/kg IV (start with 1 mg/kg)
- with or without **midazolam**: 0.1–0.3 mg/kg IV

**Heliox, Invasive Ventilation, and Non-Invasive Ventilation**
These treatments require consultation with the Intensive Care Unit (ICU)

**Notes**
- Intubated/ventilated patients may require ongoing sedation +/- paralytics
- Ketamine may be an effective bronchodilator at higher doses (2–3 mg/kg)
- Avoid high volumes & rates when assisting ventilation (↑ air trapping)
- Rule out pneumothorax and upper airway obstruction

---

**Table: Comparative Inhaled Corticosteroids (ICS) Dosing Categories in Adults**

<table>
<thead>
<tr>
<th>PRODUCT</th>
<th>Dose (mg)</th>
<th>Low</th>
<th>Medium</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beclomethasone dipropionate HFA</td>
<td>QVAR®</td>
<td>≤ 250</td>
<td>251–500</td>
<td>&gt; 500</td>
</tr>
<tr>
<td>Budesonide*</td>
<td>Pulmicort® Turbuhaler®</td>
<td>≤ 400</td>
<td>401–800</td>
<td>&gt; 800</td>
</tr>
<tr>
<td>Ciclesonide*</td>
<td>Alvesco®</td>
<td>≤ 200</td>
<td>201–400</td>
<td>&gt; 400</td>
</tr>
<tr>
<td>Fluticasone</td>
<td>Flovent® MDI and spacer, Flovent® Diskus®</td>
<td>≤ 250</td>
<td>251–500</td>
<td>&gt; 500</td>
</tr>
<tr>
<td>Mometasone*</td>
<td>Asmanex® Twisthaler®</td>
<td>200 ≤ 400–800</td>
<td>&gt; 800</td>
<td></td>
</tr>
</tbody>
</table>

---

**Table: Peak Expiratory Flow (PEF) in Normal Adults (L/min)**

<table>
<thead>
<tr>
<th>AGE</th>
<th>Low</th>
<th>Medium</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>18-20</td>
<td>142</td>
<td>154</td>
<td>166</td>
</tr>
<tr>
<td>21-24</td>
<td>154</td>
<td>166</td>
<td>178</td>
</tr>
<tr>
<td>25-29</td>
<td>166</td>
<td>178</td>
<td>190</td>
</tr>
<tr>
<td>30-34</td>
<td>178</td>
<td>190</td>
<td>202</td>
</tr>
<tr>
<td>35-39</td>
<td>190</td>
<td>202</td>
<td>214</td>
</tr>
<tr>
<td>40-44</td>
<td>202</td>
<td>214</td>
<td>226</td>
</tr>
<tr>
<td>45-49</td>
<td>214</td>
<td>226</td>
<td>238</td>
</tr>
<tr>
<td>50-54</td>
<td>226</td>
<td>238</td>
<td>250</td>
</tr>
<tr>
<td>55-59</td>
<td>238</td>
<td>250</td>
<td>262</td>
</tr>
<tr>
<td>60-64</td>
<td>250</td>
<td>262</td>
<td>274</td>
</tr>
<tr>
<td>65-69</td>
<td>262</td>
<td>274</td>
<td>286</td>
</tr>
<tr>
<td>70-74</td>
<td>274</td>
<td>286</td>
<td>298</td>
</tr>
<tr>
<td>75-79</td>
<td>286</td>
<td>298</td>
<td>310</td>
</tr>
<tr>
<td>80-84</td>
<td>298</td>
<td>310</td>
<td>322</td>
</tr>
<tr>
<td>85+</td>
<td>310</td>
<td>322</td>
<td>334</td>
</tr>
</tbody>
</table>

---

*Adult Normal Range (2 SD) = mean ± 2SD. Values calculated from Nunn and Gregg BMJ 1989 309 766/70.

Adults > 15 years of age

---

**Table: Medications for Emergency Management of Adult Asthma**

**Beta₂ agonist (inhaled salbutamol)**

<table>
<thead>
<tr>
<th>TRADE NAME</th>
<th>DOSAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>QVAR®</td>
<td>≤ 250</td>
</tr>
<tr>
<td>Pulmicort® Turbuhaler®</td>
<td>≤ 400</td>
</tr>
<tr>
<td>Alvesco®</td>
<td>≤ 200</td>
</tr>
<tr>
<td>Flovent® MDI and spacer, Flovent® Diskus®</td>
<td>≤ 250</td>
</tr>
<tr>
<td>Asmanex® Twisthaler®</td>
<td>200 ≤ 400–800</td>
</tr>
</tbody>
</table>

**References**

---

Copyright © 2008-2013 Ontario Lung Association. All rights reserved. Without the prior written permission of the Ontario Lung Association, any and all copying, reproduction, distortion, translation, modification, or the authorization of any such acts is strictly prohibited. Feb 26, 2013
**Emergency Department**  
**Asthma Care Pathway**  
**Adult: 16 Years and over**  
**PHYSICIAN’S ORDERS**

**Drug Allergies:**

Ht: ___ cm  Wt: ___ kg  Please use ballpoint pen and press firmly

---

**ADULT EMERGENCY DEPARTMENT ASTHMA CARE PATHWAY (EDACP)**  
*Refer to Medication Guidelines on reverse of orders.*

### FOR MILD, MODERATE OR SEVERE ASTHMA

*orders marked with an asterisk may have been started per Adult EDACP Medical Directive

1. ☑ baseline respiratory assessment, then q 30 – 60 mins and PRN
2. ☑ vital signs OR q ___
3. *☐ lung function at baseline, after treatment, and before disposition:  
   ☐ FEV\(_1\) OR ☐ PEF (FEV\(_1\) preferred if equipment/personnel available)
4. *☐ oxygen: ☐ to keep S\(_{\text{a}}\)O\(_2\) at 92% or greater OR ☐ at 95% or greater (if pregnant)
5. ☑ intravenous access: ☐ saline lock OR ☐ ______________
6. ☑ blood gases: ☐ venous OR ☐ arterial
7. beta\(_2\)-agonist: salbutamol MDI (100 mcg/puff) + spacer  
   *☐ initial dose: 6 puffs inhaled q ___ mins x 3 doses PRN  
     ☐ subsequent doses: ____ puffs inhaled q 4h and q1h PRN
   OR salbutamol solution (5 mg/mL)  
   *☐ initial dose: 5 mg in 3 mL 0.9% sodium chloride q ___ mins x 3 doses PRN  
     ☐ subsequent doses: 5 mg in 3 mL 0.9% sodium chloride q 4h and q1h PRN
8. anticholinergic: ipratropium bromide MDI (20 mcg/puff) + spacer  
   *☐ initial dose: 6 puffs inhaled q ___ mins x 3 doses PRN  
     ☐ subsequent doses: ____ puffs inhaled q 4h
   OR ipratropium bromide solution (250 mcg/mL)  
   *☐ initial dose: 500 mcg in 3 mL 0.9% sodium chloride q ___ mins x 3 doses PRN  
     ☐ subsequent doses: 500 mcg in 3 mL 0.9% sodium chloride q 4h
9. corticosteroid (as soon as possible and within 60 minutes of triage)  
   *☐ predniSONE 50 mg PO once now  
   OR ☐ predniSONE ___ mg PO once now  
   OR ☐ methylPREDNISolone ___ mg IV (40–125 mg) once now, as bolus  
     (if oral route unavailable or unreliable)
10. magnesium sulfate (*for severe asthma only*)  
    ☑ magnesium sulfate 2 g IV once now over 20 mins (dilute in 100mL D5W)
    **Note:** check BP q 5 mins during infusion and for 30 mins after infusion is complete

**At Discharge or Admission:**

11. ☑ review asthma education checklist
12. referral to: ☐ respiratory therapy ☐ asthma educator ☐ specialist: ______________

If patient status deteriorates, or if there is inadequate response to treatment,  
consider moving to “Potentially Fatal Asthma” pathway

**MD Name:** __________________  **MD Signature:** __________________

**Date (YYYY/MM/DD):** __________________  **Time:** __________________
### ADULT EMERGENCY DEPARTMENT ASTHMA CARE PATHWAY (EDACP)

**Refer to Medication Guidelines on reverse of orders**

**FOR POTENTIALLY FATAL ASTHMA**

Consider Consulting: Respirology, ICU, Anesthesiology, Internal Medicine and/or CritiCall Ontario: 1-800-668-4357

For Intubation Agents refer to Medication Guidelines on reverse.

1. ☑ high flow oxygen (> FiO₂ 0.60 if possible) to keep S₉O₂ at 92% or greater
2. ☑ continuous cardiac and oxygen saturation monitoring
3. ☑ intravenous access: (if not already obtained) ☐ saline lock ☐ __________
4. ☑ nothing by mouth
5. ☑ salbutamol 5 mg in 3 mL 0.9% sodium chloride, continuous nebulization
6. ☑ ipratropium bromide 500 mcg, continuous nebulization; mix with salbutamol
7. IV corticosteroid (if not already given)
   - ☐ methylPREDNISolone 125 mg IV once now as bolus
8. magnesium sulfate (if not already given)
   - ☐ magnesium sulfate 2 grams IV once now over 20 mins, dilute in 100 mL D5W
   - **Note:** check BP q 5 mins during infusion and for 30 mins after infusion is complete
9. epinephrine
   - ☐ epinephrine 0.3 mg IM now and q 20 mins PRN (0.3 mL of 1:1,000 solution)
   - **Note:** for pre-arrest, consider IV epinephrine (see Medication Guidelines on reverse)
10. **Tests:**
    - ☑ chest x-ray (portable)
    - ☑ blood gases: ☐ venous ☐ arterial
    - ☑ CBC, electrolytes, urea, creatinine, glucose
    - ☐ ECG
    - ☐ attempt spirometry (FEV₁) or peak expiratory flow (PEF)

### At Discharge or Admission:

11. ☑ review asthma education checklist
12. referral to: ☐ respiratory therapy ☐ asthma educator ☐ specialist: __________

**Additional Orders:** _________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

**MD Name:** ______________________  **MD Signature:** ______________________

**Date (YYYY/MM/DD):** ___________  **Time:** ___________
Emergency Department
Asthma Care Pathway
Adult: 16 years and over
Patient Discharge
Instructions/Prescription

☐ Discharge FEV1: ______ L % predicted ______

OR  ☐ Discharge Peak Flow: ______ L/min % predicted ______

Circle Presenting Asthma Severity: Mild Moderate Severe

Discharge Instructions: Physician/Nurse Practitioner to complete
FAX to Patient’s Primary Care Provider

1. **Reliever Medication**: (circle) salbutamol (e.g. Airomir™, Apo®-Salvent, Teva-Salbutamol®, ratio-Salbutamol®, Ventolin®) or terbutaline (e.g. Bricanyl®) or other___________________________

   For the first 48 hours, take your reliever (circled above) ___ inhalations 4 times a day and, if needed, every 4 hours (while awake) to relieve asthma symptoms.

   After the first 48 hours, use reliever ___ inhalations only as needed, up to every 4 hours.

   *If you need your reliever more often than every 4 hours, call your doctor
   *If your reliever is lasting less than 2 hours, go the Emergency Department

2. **Prednisone**: 

   Take prednisone ______mg, once a day for _____ days, in the morning (with food) until the prescription is finished.

3. **Controller Medication**: 

   (circle) Single Medication: Alvesco®, Asmanex™, Flovent®, Pulmicort®, QVAR™ or other___________________________

   Combination Medication: Advair®, Symbicort®, Zenhale™ or other___________________________

   Take your controller (circled above) ____ mcg/inhalation, ___ inhalation(s) ___ time(s) per day, even when you are feeling well.

4. **Additional Medication**: 

   Take: _____________________________________________________________________
   
   Take: _____________________________________________________________________

   **NOTE**: Continue with the other medication you were taking at home unless advised otherwise

5. **Please make a follow-up appointment with**: 

   ☐ Family Doctor________________________________________ within 1 week or as soon as possible
   ☐ Specialist__________________________________________ within 2 to 4 weeks
   ☐ Your local Asthma Education Centre ________________________________

   Name: ____________________________________ CPSO#__________ CNO#_______
   Signature:_____________________________ Date::_____________ Time:__________

Return to the Emergency Department immediately if any of the following occur:

• Your symptoms worsen
• Your reliever medication is lasting less than 2 hours
• You cannot talk in sentences without taking a breath
• You have blueness around your lips and nails
• You are unsure or frightened by your asthma

**REMEMBER…Asthma can be **LIFE THREATENING**, especially IF NOT TREATED**

Important Asthma Information on Back
QUICK FACTS ABOUT ASTHMA…

What is Asthma?
Asthma affects the airways (bronchi) in your lungs.
Three main things happen in your airways when you have asthma:

- the lining of your airways swells (inflammation) and makes more mucus
- the airways become sensitive or twitchy to triggers
- the muscles that wrap around your airways tighten

These changes make your airways narrow and cause the symptoms of asthma

Symptoms of asthma can include: wheezing, cough, chest tightness and shortness of breath. You may have just one symptom or a combination of these symptoms

Asthma Triggers
Examples of asthma triggers include: smoke, lung infections/colds, allergies (such as to animals, dust mites, pollens, moulds), strong odours, air pollution, exercise, high humidity, stress and cold air.

- not everyone with asthma has the same triggers
- it is important to know what triggers your asthma
- avoiding things that trigger your asthma can reduce the amount of medication needed to control your asthma and can reduce your asthma symptoms

Asthma Medications
There are three major categories of medications used to treat asthma:

1. Relievers: salbutamol (examples: Airomir™, Apo-Salvent®, Teva-Salbutamol®, ratio-Salbutamol®, Ventolin®) or terbutaline (example: Bricanyl®)
   - relax the muscles that tighten around the airways
   - are used to treat asthma symptoms and provide relief within minutes
   - are taken on an as needed basis when you are well
   - can be used frequently during an asthma attack

2. Prednisone: (white pill)
   - is used to treat severe airway inflammation (swelling) and mucus;

3. Controllers: single medication (examples: Alvesco®, Asmanex™, Flovent®, Pulmicort®, QVAR™)
   OR combination of 2 medications (examples: Advair®, Symbicort®, Zenhale™)
   - control asthma symptoms and prevent asthma from flaring
   - generally treat airway inflammation (swelling) and mucus; combination controllers also include a medication that relaxes the airway muscles for up to 12 hours
   - need to be taken regularly even when you feel well

Your Asthma Is In Control If:
- you have symptoms (cough, wheeze, chest tightness or shortness of breath) less than 4 days a week
- you use your reliever less than 4 times per week
- you are not waking at night or early in the morning with symptoms
- you can do your usual physical activities and you do not miss school or work due to asthma

REMEMBER…Asthma can be LIFE THREATENING, especially IF NOT TREATED

IF YOU HAVE QUESTIONS ABOUT ASTHMA CALL:
The Lung Association’s Lung Health Information Line
1-888-344-LUNG (5864) or visit online: www.on.lung.ca
# Emergency Department
## Asthma Care Pathway
### Adult: 16 years and over

### Education Checklist

#### Learning Goals Reviewed with Patient

(To be completed by MD/Nurse/RT)

<table>
<thead>
<tr>
<th>Initials &amp; Comments</th>
</tr>
</thead>
</table>

1. **Assessed device/spacer technique and demonstrated optimal technique:**
   - MDI: Shake canister, place end of MDI into holding chamber; breathe out, place holding chamber mouthpiece into mouth and make a seal; release puff, inhale slowly (no whistle), hold for 10 seconds, exhale; wait 30 seconds between each puff of the same MDI.

2. **Reviewed basics of asthma:**
   - airway inflammation (swelling), increased mucus, and bronchospasm
   - airways narrow and cause the symptoms of asthma: cough, wheeze, chest tightness and/or shortness of breath

3. **Reviewed asthma triggers:**
   - not everyone with asthma has the same triggers.
   - important to know what the individual’s asthma triggers are and how to avoid them.
   - trigger avoidance can reduce the amount of medication needed to control asthma and can reduce asthma symptoms.

4. **Reviewed asthma medications:**
   - **Relievers:** salbutamol (e.g. Airomir™, Apo-Salvent®, Teva-Salbutamol®, ratio-Salbutamol®, Ventolin®) or terbutaline (Bricanyl®)
     - relax smooth muscle around airways
   - **Prednisone:** treats severe airway inflammation and mucus
   - **Controllers:** single medication: e.g. Alvesco®, Asmanex™, Flovent®, Pulmicort®, QVAR™
     - combination of 2 medications: e.g. Advair®, Symbicort®, Zenhale™
     - treat airway inflammation and mucus; combinations include a medication to relax airway muscles for up to 12 hours (long-acting beta₂-agonist)
     - need to be taken regularly even when feeling well

5. **Reviewed parameters for acceptable asthma control (below) and when to return to the Emergency Department (on front of Discharge Instructions).**
   - symptoms less than 4 days per week
   - reliever use less than 4 times per week
   - not waking at night or early in the morning with symptoms
   - not missing school or work due to asthma

6. **If patient does not have a drug plan,** refer to Social Work *(if available)* or the Trillium Program (applications usually available at the local pharmacy).

7. **If patient does not have a family physician,** ED physician notified and alternatives discussed *(if available).*

8. **Patient Discharge Instructions reviewed with patient** and 2 copies given to patient *(one for the pharmacy, one for patient reference)*

9. **Hospital’s Asthma Booklet** *(if available)* or Lung Association Booklet given to patient.

### Name (print): ___________________________  Designation: ______

### Signature: ___________________________  Date: ____________  Time: ____________
**Emergency Department Adult Asthma Medical Directive**

<table>
<thead>
<tr>
<th>Title: Emergency Department Asthma Medical Directive – Adult Age 16 years and over</th>
<th>Number:</th>
</tr>
</thead>
</table>

**Activation Date:**

**Review due by:**

**Sponsoring/Contact Person(s):**

(hospital based site champion e.g. professional practice advisor(s), clinical educator)

Ontario Lung Association – www.on.lung.ca

**Order and/or Delegated Procedures:**

<table>
<thead>
<tr>
<th>Appendix Attached: Yes ☐ No</th>
<th>Title: Appendix A: Medical Directive Flowchart</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. supplemental oxygen to keep SaO2 at 92% or greater (95% or greater in pregnancy)</td>
<td></td>
</tr>
<tr>
<td>2. spirometry (FEV1) or peak expiratory flow (PEF) - complete as per Flowchart, Appendix A attached</td>
<td></td>
</tr>
<tr>
<td>3. salbutamol metered dose inhaler (MDI) with spacer device (100 mcg/puff) 6 puffs/dose, up to 3 doses (18 puffs) within 60 minutes - complete as per Flowchart, Appendix A attached</td>
<td></td>
</tr>
<tr>
<td>4. ipratroprium bromide MDI with spacer device (20 mcg/puff) 6 puffs/dose, up to 3 doses (18 puffs) in 60 minutes - complete as per Flowchart, Appendix A attached</td>
<td></td>
</tr>
<tr>
<td>5. prednisone 50mg PO once at triage</td>
<td></td>
</tr>
</tbody>
</table>

**Recipient Patients:**

Patients who are registered in the Emergency Department presenting with symptoms of an acute asthma exacerbation (e.g. dyspnea, wheezing), under the care of an authorizing physician, who meet the following:

**Inclusion criteria:** Age 16 years or older with one of the following: history of asthma; or previous episode of wheezing requiring treatment; or asthma and pregnancy; or COPD with asthma

**Exclusion criteria:** COPD without asthma; or CHF; or chest pain different from patient's normal or ED visit for prescription refill only.

**Authorized Implementers:**

Nurses, Respiratory Therapists, Pharmacists registered and in good standing with their respective regulatory college in Ontario, who have received up-to-date education and training on this medical directive.
Indications:

Age 16 years or older presenting with mild, moderate or severe symptoms of asthma, with one of the following: history of asthma; or previous episode of wheezing requiring treatment; or asthma and pregnancy; or COPD with asthma.

Contraindications:

- patient does not fit the inclusion criteria
- patient or Substitute Decision Maker does not give consent
- spirometry or peak expiratory flow:
  - patient unable to perform test
- salbutamol:
  - heart rate greater than 140 beats per minute requires emergent physician assessment
  - allergic to salbutamol – hold salbutamol and proceed with rest of medical directive
- ipratropium bromide:
  - allergic to ipratropium bromide - hold ipratropium bromide and proceed with rest of medical directive
- prednisone:
  - allergic to prednisone – hold prednisone and proceed with rest of medical directive

Consent:

Consent must be provided by patient or substitute decision maker prior to commencing medical directive.

Guidelines for Implementing the Order/Procedure:

This medical directive allows nurses, respiratory therapists or pharmacists to initiate quantitative assessment, pharmacotherapy with inhaled bronchodilators and oral corticosteroids as soon as possible to adults 16 years and over who present to the Emergency Department with a clinical picture consistent with asthma and who are entered into the Adult Emergency Department Asthma Care Pathway (Asthma Pathway).

Although it is intended that these patients will be treated by a physician according to the Asthma Pathway, the earliest possible nurse/respiratory therapist/pharmacist-initiated therapy will allow symptom relief while awaiting assessment by the physician and is anticipated to shorten the patient’s length-of-stay in the ED. Dosage, frequency and choice of medication will be determined by the degree of respiratory distress as described in the Asthma Pathway decision tree appended to this medical directive.

If the patient’s condition worsens at any time, the physician is to be notified STAT.
<table>
<thead>
<tr>
<th>Documentation and Communication:</th>
<th>Appendix Attached: □ Yes □ No</th>
<th>Title:</th>
</tr>
</thead>
<tbody>
<tr>
<td>As per institution’s policy and procedure for documentation of implementation of medical directives</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Review and Quality Monitoring Guidelines:</th>
<th>Appendix Attached: □ Yes □ No</th>
<th>Title:</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Administrative Approvals (as applicable):</th>
<th>Appendix Attached: □ Yes □ No</th>
<th>Title:</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Approving Physician(s)/Authorizer(s):</th>
<th>Appendix Attached: □ Yes □ No</th>
<th>Title:</th>
</tr>
</thead>
</table>
Appendix A: Medical Directive Flowchart: post triage according to CTAS standards

Emergency Department Adult Asthma Medical Directive

Mild and Moderate Asthma
Mild: FEV₁ or PEF > 60% predicted/personal best
Moderate: FEV₁ or PEF 40 to 60% predicted/personal best

Severe Asthma
FEV₁ or PEF < 40% predicted/personal best or unable to do

Potentially Fatal Asthma
FEV₁ or PEF – unable to do

CTAS 3

Within 30 minutes of triage

Administer oxygen as required to keep SaO₂ ≥ 92% or ≥ 95% in pregnancy

CTAS 2

Within 10 minutes of triage

Administer Bronchodilators:

Either

- salbutamol via metered dose inhaler (MDI) and spacer - 6 puffs (100 mcg/puff)
- ipratropium bromide via MDI and spacer – 6 puffs (20 mcg/puff)
  • Alternate salbutamol and ipratropium bromide puffs
  • Allow 30 seconds between puffs from the same pMDI canister to ensure proper dose delivery
  • Use valved spacer device with mask if patient is unable to make a seal around mouthpiece
  • May repeat q 10-15 mins, up to 3 consecutive doses within first hour depending on asthma severity; maximum 18 puffs of each medication within first hour
  • If FEV₁ or PEF is < 40% of predicted request physician to consider increasing maximum salbutamol dose up to 20 puffs

Or

- salbutamol via small volume nebulizer – 5mg (5 mg/mL solution)
- ipratropium bromide via small volume nebulizer – 250 or 500 mcg (125 mcg/mL or 250 mcg/mL solution)
  • Mix salbutamol and ipratropium bromide, add normal saline for total volume of 3 mL;
  • May repeat q 10-15 mins, up to 3 consecutive doses within first hour depending on asthma severity

CTAS 1

Immediately

Call MD STAT

Determine HR. If ≥ 140, physician to assess patient emergently.
Establish baseline FEV₁ or PEF, if possible (able to follow directions, trained staff member available, able to demonstrate reproducibility within 10%.) ; repeat after treatment and before disposition
Do not delay pharmacotherapy while obtaining FEV₁ or PEF

Assess patient regarding requirement for oral corticosteroids:
- Does patient have active or suspected chickenpox infection?

Hold corticosteroid
Notify Physician

YES

NO

Are there any concerns regarding patient’s ability to swallow?

Notify MD
Obtain further orders for therapy.

YES

NO

Administer as soon as possible and within 60 minutes of triage:
prednisone 50 mg once

Notify MD if clinical condition deteriorates, if HR ≥ 140/min or if patient develops tremors

Notify MD
Obtain further orders for therapy.
Adult Emergency Department Asthma Care Pathway (EDACP)
References


Kingston General Hospital “Adult Collaborative Care Plan” Medication Guidelines


