Emergency Department
Protocol Initiative

ACUTE ASTHMA MANAGEMENT TOOLKIT

March 2006

Provincial Emergency Services Project
A. Overview of the ED Protocol Initiative

Protocols and guidelines are being published for Emergency Department (ED) clinical conditions at an increasing rate. As all ED staff know, clinical guidelines/protocols make good sense, ensuring that the best care possible is provided for the patient. However, there is no standardized effective process in BC by which guidelines can be screened, reviewed, and adopted into ED clinical practice. Nor are there support mechanisms for ED teams to develop the necessary materials, educational programs, and order sets.

The ED Protocol Initiative will provide these kinds of support. An ED Protocol Working Group (EDPWG) whose membership includes physicians, nurses, respiratory therapists and guideline implementation experts has developed a toolkit to streamline the management of asthma. Its goal is to create an easy-to-use implementation process that will allow EDs to incorporate the latest clinical guidelines into day-to-day patient care management. Initially, six sites were involved in piloting the asthma protocol process. After the pilot site evaluation, the implementation process and toolkit was revised based on the feedback from key stakeholders. This updated toolkit has been provided to assist health authorities to spread the asthma protocol throughout all EDs in British Columbia. This toolkit is NOT meant to be prescriptive but instead provides user-friendly tools, which can be used to streamline the implementation process.

The ED Protocol Initiative is a key project within the larger Provincial Emergency Services Project (PESP). The Provincial Emergency Services Project (PESP), under which the ED Protocol Initiative falls, was launched in November 2002 as a collaborative, province-wide approach to improve access, utilization, and effectiveness of emergency services throughout BC. The Provincial Health Services Authority – which as one of BC’s six health authorities plans, manages, and evaluates specialty and province-wide health care services – coordinates the PESP on behalf of the health authorities. The Provincial Emergency Services Project is led by the Provincial Critical Services Steering Committee, which is comprised of executive representatives from the health authorities, Ministry of Health Services and other key stakeholders who provide emergency services in BC.
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B. Standards Statements For Treatment Of Adult And Pediatric Asthma

1.0 INTENT
1.1 To standardize and expedite treatment of mild to severe episodes of asthma for patients in the ED
1.2 To reduce hospital visits to the ED by facilitating follow-up through an Asthma clinic or Asthma Educator
1.3 To evaluate the compliance to completing key performance indicators

2.0 GOVERNING GUIDELINES
2.1 Triage RN to categorize asthmatic patients by severity using established CTAS (Canadian Triage Acuity Scale) criteria for mild, moderate and severe episodes, corresponding to CTAS level 3, 2, 1 respectively
2.2 All pediatric patients must have a pre-existing diagnosis of asthma and be over age 2 to be eligible for the standard order set. In children who are unable to do spirometry, particularly those under age 6, clinical features and O2 saturation are used to estimate severity.
2.3 All adults who demonstrate symptoms outlined in the established CTAS criteria are eligible for the standard order set.
2.4 Patients with symptoms of severe episodes (CTAS Level I) must be moved to the resuscitation area and are to be seen by the emergency physician as soon as possible (immediately if in-house).
2.5 Physician to assess all patients prior to discharge
2.6 Referral to Asthma Clinic/Educator for all patients prior to discharge
2.7 Asthma Clinic/Educator to review referral and follow up with patients after discharge. Asthma clinic to determine means of follow up required

3.0 DEFINITIONS
3.1 CTAS Level 1 - Near death asthma – unable to speak, cyanosis, lethargic/confused, tachycardia or bradycardia, O2 sat < 90%
3.2 CTAS Level 2 - Severe asthma is best defined with a combination of objective measures (FEV1, PEFR, O2 saturation) and clinical factors which relate to the severity of symptoms, vital signs and history of previous severe episode. O2 saturation < 90% (O2 Saturation <92% child), PEFR < 40% of predicted or previous best, the patient is considered severe and requires prompt treatment and close observation until signs of improvement. In children who are unable to do spirometry, particularly those under age 6, clinical features and O2 saturation are used to estimate severity.
3.3 CTAS Level 3 - Mild/moderate SOBOE, frequent cough or night awakening (unable to lie down flat without symptoms) and PEFR 40 – 60 % predicted or previous best and O2 sat > 92-94%. Mild asthma is PEFR > 60% and O2 saturation > 95%. Mild asthmatics can have severe attacks and severe asthmatics can have mild attacks.
Some documentation of meds and previous attack patterns (intubated, ICU, frequent admits) can help to identify high-risk individuals. These patients should be placed in an area where they can be observed and re-evaluated, and the patient or family should be advised to report deterioration to the emergency staff.

4.0 REFERENCES
4.1 Vancouver Island Health Authority, Guideline for Emergency Management of Pediatric Asthma.
4.4 CTAS Canadian ED Triage and Acuity Scale. CJEM/CMC Special Supplement. October 1999.
4.8 CJEM/JCMU 2003; Volume 5, Number 3, 179-209
4.9 CJEM/JCMU 2001; Volume 3, Number 2, April
4.10 Fraser Health Authority. Respiratory Services. Pediatric Asthma Protocol 2.4.40
4.11 Fraser Health Authority. Doctors Order DO:153
4.13 Form #004739, Seven Oaks General Hospital Multidisciplinary Caremap, Asthma Caremap Emergency Department, February 1999.
C. Asthma Reference Materials

The Tool Kit includes a broad base of reference material. The following is a list and brief description of each reference used in the development of the asthma protocol. They are included in the Appendix section in this binder.

**Canadian Asthma Consensus Report (1999):** This is the 64 page, complete Canadian Consensus Report for the diagnosis and optimal management of asthma in adults and children.

**Summary of Report of Recommendations (1999):** This is a 14-page, executive summary of the Canadian Consensus Report recommendations for the diagnosis and optimal management of asthma in adults and children.

**Canadian Guideline Update (2003):** This 20-page guide updates the 1999 Canadian Asthma Consensus Guidelines.

**British Guideline on the Management of Asthma (2004):** This 95 page guideline outlines the diagnosis and optimal management of asthma in adults and children.

**Position Statement from BC Children's Hospital:** This document is a summary of the rational for Ventolin and Steroid use in pediatric patient population.

**Sedation and Anxiolysis Guide:** This document contains guidelines for sedating an intubated asthmatic patient.
D. Triage Tools

The following is a list and brief description of each triage tool:

- **Asthma Triage Algorithm (CTAS levels)** (Algorithm for Patient Presenting with Shortness of Breath/Wheezing with a Probable of Asthma)

- **Peak Flow Prediction Chart.** Provides the predicted value of Peak Expiratory Flow Rate (PEFR) based on height, age and gender (only Height and age with children).

- **Triage Teaching Tools**
Algorithm for Patient Presenting with Shortness of Breath/Wheezing with a Probable Diagnosis of Asthma

*Determine initial treatment algorithm by assigning CTAS level using symptoms, signs and peak flow.*

<table>
<thead>
<tr>
<th>SYMPTOMS</th>
<th>MILD</th>
<th>MODERATE</th>
<th>SEVERE</th>
<th>NEAR DEATH</th>
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<tbody>
<tr>
<td>Breathless</td>
<td>While walking</td>
<td>While talking (infant – softer, shorter cry, difficulty feeding)</td>
<td>While at rest</td>
<td>Decreasing respiratory effort</td>
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<tr>
<td>Talking</td>
<td>In sentences</td>
<td>In phrases</td>
<td>In words</td>
<td>Unable to speak</td>
</tr>
<tr>
<td>Alertness</td>
<td>May be agitated</td>
<td>Usually agitated</td>
<td>Usually agitated</td>
<td>Confused or lethargic</td>
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</table>

**SYMPTOMS**
- **MILD**
  - Breathless: While walking
  - Talking: In sentences
  - Alertness: May be agitated

**MODERATE**
- Breathless: While talking (infant – softer, shorter cry, difficulty feeding)
- Talking: In phrases
- Alertness: Usually agitated

**SEVERE**
- Breathless: While at rest
- Talking: In words
- Alertness: Usually agitated

**NEAR DEATH**
- Breathless: Decreasing respiratory effort
- Talking: Unable to speak
- Alertness: Confused or lethargic

**SIGNS**

<table>
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<tr>
<th>RESPIRATORY RATE</th>
<th>INCREASED</th>
<th>INCREASED</th>
<th>OFTEN &gt; 30/min</th>
<th>&gt; 30/min UNLESS IMMINENT RESP. FAILURE</th>
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<tr>
<td>USE OF ACCESSORY MUSCLES</td>
<td>USUALLY NOT</td>
<td>COMMONLY</td>
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<tr>
<td>WHEEZE</td>
<td>MILD</td>
<td>LOUD THROUGHOUT EXPIRATION</td>
<td>LOUD THROUGHOUT INS/EXP OR SILENT</td>
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<td>PULSE/MIN (ADULT)</td>
<td>&lt; 100</td>
<td>100 - 120</td>
<td>&gt; 120</td>
<td>&gt; 120 OR BRADYCARDIA IF RESP. FAILURE</td>
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**FUNCTIONAL ASSESSMENT**

| SP02 ON ROOM AIR       | > 95%                         | 92 - 94% (CHILD)             | < 90%                           | < 90%                                 |
| PEFR% PREDICTED OR % PERSONAL BEST | > 200 lpm | > 200 lpm | < 200 lpm | UNABLE |

| TIME TO NURSE ASSESSMENT | 30 MINUTES | 30 MINUTES | IMMEDIATE | IMMEDIATE |
| TIME TO PHYSICIAN ASSESSMENT | 30 MINUTES | 30 MINUTES | 15 MINUTES | IMMEDIATE |
| INITIAL TREATMENT ALGORITHM | CTAS LEVEL 3 | CTAS LEVEL 3 | CTAS LEVEL 2 | CTAS LEVEL 1 |

**CTAS Level 1** - Near death asthma – unable to speak, cyanosis, lethargic/confused, tachycardia or bradycardia, O2 sat < 90%

**CTAS Level 2** - Severe asthma is best defined with a combination of objective measures (FEV1, PEFR, O2 saturation) and clinical factors which relate to the severity of symptoms, vital signs and history of previous severe episode. O2 saturation < 90% (O2 Saturation <92% child). PEFR < 40% of predicted or previous best, the patient is considered severe and requires prompt treatment and close observation until signs of improvement. In children who are unable to do spirometry, particularly those under age 6, clinical features and O2 saturation are used to estimate severity.

**CTAS Level 3** - Mild/moderate SOBOE, frequent cough or night awakening (unable to lie down flat without symptoms) and PEFR 40 – 60 % predicted or previous best and O2 sat > 92-94%. Mild asthma is PEFR > 60% and O2 saturation > 95%. Mild asthmatics can have severe attacks and severe asthmatics can have mild attacks. Some documentation of meds and previous attack patterns (intubated, ICU, frequent admits) can help to identify high-risk individuals. These patients should be placed in an area where they can be observed and re-evaluated, and the patient or family should be advised to report deterioration to the emergency staff.
Peak Expiratory Flow Rate Prediction Charts

Predicted PEFR (L/min) for ADULT Males, calculated from NHANESIII

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Predicted PEFR (L/min) for ADULT Females, calculated from NHANESIII

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<td>370</td>
<td>391</td>
<td>413</td>
<td>435</td>
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</tr>
</tbody>
</table>
Predicted PEFR (L/min) for CHILDREN

<table>
<thead>
<tr>
<th>Height (Inches)</th>
<th>Average Peak Flow</th>
<th>Height (Inches)</th>
<th>Average Peak Flow</th>
</tr>
</thead>
<tbody>
<tr>
<td>43</td>
<td>147</td>
<td>55</td>
<td>307</td>
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<tr>
<td>44</td>
<td>160</td>
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<td>48</td>
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</tr>
<tr>
<td>54</td>
<td>293</td>
<td>66</td>
<td>454</td>
</tr>
</tbody>
</table>


How to use Peak Expiratory Flow Rate Prediction Charts

1. To calculate Predicted Peak Expiratory Flow Rate (PEFR), the patient’s age, height and gender are required.

2. There are 3 charts, adult men, adult women, and children.

3. On the relevant chart, plot the patient’s age against height. Follow the column and row to where they intersect. This is the patient’s Predicted Peak Expiratory Flow Rate.

4. Use the patient’s stated Personal Best PEFR if they know it. It will be more relevant to the patient.

5. Multiply PEFR by 0.6 to obtain 60% PEFR.
## Triage Teaching Tools

<table>
<thead>
<tr>
<th>COMPONENT</th>
<th>CONTENT</th>
</tr>
</thead>
</table>
| Peak Flow Meters, Posters, and Management Cards | Materials and tools could be made available for patients upon arrival:  
  A. Peak flow meters  
  B. Peak flow meter instructions poster  
  C. Peak flow zone management cards |
| Space Chamber, Placebo Puffers, Puffer Chart, and Related “How To” Materials | Same as above; would allow patient to improve their knowledge of condition and puffers:  
  A. Space chamber  
  B. Placebo puffers  
  C. Puffer chart  
  D. Nose clips |
| ED Display Tools, 30 Sec Asthma Test Tear-away Sheets, and Posters | Same as above:  
  A. 30 Second Asthma Test poster  
  B. 30 Second Asthma Test tear-away sheets  
  C. Lung Display for 30 Second Test (normal and inflamed) |

*This component comes in a number of different languages; available upon request.*

Toolkit Components designated with a ☑ can be ordered from:  
Subjit Dhdenshaw  
Industry Sponsor Representative  
GlaxoSmithKline  
PHONE: 1 – 800 – 461 – 7096, ext. 9340  
EMAIL: subjit.k.dhdenshaw@gsk.com
E. Protocol, Order Forms and Documentation

The following are guidelines for emergency management of adult asthma and for pediatric asthma. Each Emergency Department/Urgent Care Centre has tailored the order forms to its own site. Each site has also determined the need for an asthma specific documentation tool. Based on the Triage assessment of asthma patient acuity, select the appropriate order form and documentation tool (if any). On discharge, patient should be provided with discharge instructions and patient education materials as determined by your site (See Section F). Included in this Section are suggested initial ventilation settings for acute asthma and instructions to deliver bronchodilators via metered dose inhaler.

- Guidelines for Emergency Management of Adult Asthma
- Guidelines for Emergency Management of Pediatric Asthma
- Physician’s Order Forms
- Emergency Asthma Documentation Tool – CTAS Level 2 & 3
- Suggested Initial Ventilation Settings for Acute Asthma
- How to Deliver Bronchodilators via Metered Dose Inhaler (MDI) with Spacer
**Guidelines for Emergency Management of Adult Asthma**

**Patient Triage / Initial Assessment**
- RR, HR, use of accessory muscles, auscultation, Shortness of Breath, PEFR, Sp02
- Add Oxygen to maintain Sp02 > 92%

**CTAS Level 2 (Severe) or 3 (Mild/Moderate)**
- Notify EP/ RT (if applicable)
- **Salbutamol 5.0mg + Ipatropium Bromide 500mcg** nebulized Rx, delivered with air at 6-8 lpm
- Deliver by 02 at 6-8 lpm, if Sp02< 92%
- **OR** Salbutamol 6-8 puffs + Ipratropium Bromide 4 puffs MDI with spacer device

- Prednisone 50 mg PO (provide info sheet)

**Reassess in 20 minutes**
- RR, HR, use of accessory muscles, auscultation, shortness of breath, PEFR, Sp02

**GOOD RESPONSE**
- PEFR > 60% of patient’s normal/predicted
- Sp02 > 92%
- Response sustained 60 minutes post Rx?

- **YES**
  - Physician to assess patient
  - Prescription given + education/pamphlets given to patient
  - Patient discharged + Referral and follow up with Asthma clinic/educator where available

- **NO**
  - Incomplete Response
    - PEFR 40 - 60% of patient’s normal/predicted
    - Sp02 not improving
    - **Salbutamol 5.0mg OR Salbutamol 6-8 puffs MDI with spacer device Q20 minutes PRN**
      - Up to 3 Rx’s
    - Reassess after last required Rx
    - RR, HR, use of accessory muscle, auscultation, shortness of breath, PEFR, Sp02

**INCOMPLETE RESPONSE**
- PEFR 40 - 60% of patient’s normal/predicted
- Sp02 not improving
- Continue Salbutamol 5.0mg OR Salbutamol 6-8 puffs MDI with spacer device Q2H + PRN
  - AND
    - Ipratropium Bromide 500mcg OR Ipratropium Bromide 4 puffs MDI with spacer device Q4H

- **YES**
  - Assess after 4-6 hours
    - Patient improved?

- **NO**
  - Admit

**CTAS Level 1 (Near Death)**
- Place patient in resuscitation room.
- Notify the physician and RT (if applicable)
- Follow physician orders for CTAS Level 1 Adult Asthma

**Physician to assess patient**

**Prescription given + education/pamphlets given to patient**

**Patient discharged + Referral and follow up with Asthma clinic/educator where available**
Guideline for Emergency Management of Pediatric Asthma (Years 2-17)

Patient Triage/ Initial Assessment
RR, HR, use of accessory muscles, auscultation, shortness of breath, PEFR, Sp02
Add Oxygen to maintain Sp02 > 95%

CTAS Level 2 (Severe) or 3 (Mild/Moderate)
Notify EP/RT (if applicable)
**Salbutamol 5.0mg nebulized Rx**
Delivered with 02 at 6-8 lpm
**OR Salbutamol 6-8 puffs MDI with spacer device**

Reassess in 10 minutes
RR, HR, use of accessory muscles, shortness of breath, PEFR, Sp02

Prednisolone 1 mg/kg PO unless contraindicated (to a max of 50mg) **OR** if elixir available Dexamethasone 0.2 mg/kg OD

GOOD RESPONSE
- PEFR > 60% patients normal/predicted
- Sp02 > 95%, colour good
- Respirations regular, unlaboured, Minimal wheezing

Response sustained 60 minutes post Rx?

- Physician to assess patient
- Prescription given + Education/ pamphlets given to family
- Patient discharged + Referral and follow up with Asthma clinic/educator where available

INCOMPLETE RESPONSE
PEFR 40-60% patient’s normal/predicted Sp02 not improving
**Salbutamol 5.0mg OR Salbutamol 6-8 puffs MDI with spacer device Q20 minutes PRN**
Up to 3 Rx’s
Reassess after last required Rx
RR, HR, use of accessory muscles, auscultation, shortness of breath, PEFR, Sp02

- Incomplete Response
  - PEFR 40 - 60% patients normal/predicted Sp02 not improving
  - Continue Salbutamol 5.0mg OR Salbutamol 6-8 puffs MDI with spacer device Q2H+PRN
  - And Ipratropium Bromide 250mcg OR Ipratropium Bromide 2 puffs MDI with spacer device Q4H

- Assess after 4-6 hours Patient improved?
- Yes
- No

CTAS 1 (Near Death)
Place patient in resuscitation room. Notify the physician and RT (if applicable) Follow physician orders for CTAS Level 1 Pediatric Asthma.

CTAS 1 (Near Death)
Place patient in resuscitation room. Notify the physician and RT (if applicable) Follow physician orders for CTAS Level 1 Pediatric Asthma.
ACUTE ASTHMA EXACERBATION: **ADULT – CTAS LEVEL 1**

**CTAS LEVEL 1**  Place patient in resuscitation area immediately. Notify physician and RT if available.
- Obtain peak flow if possible
- Oxygen to maintain SpO₂ > 92%
- Continuous salbutamol 5 mg + ipratropium 0.5 mg by nebulizer until improvement
- Initiate Normal Saline IV at _________ mL/hour
- Cardiac monitor
- Pulse oximetry
- Assess for intubation need (suggested medications below)  Patient weight _____ kg

- Consider pretreatment: Lidocaine 1.5 mg/kg (_______ mg) IV once
- Ketamine 1-2 mg/kg (_______ mg) IV once
- Succinylcholine 1.5 mg/kg (_______ mg) IV once

- Methylprednisolone 125 mg IV once
- Portable chest x-ray to rule out pneumothorax/ alternate diagnosis
- If severe exacerbation and poor or no response, consider
  - Magnesium 2 g IV in 50 mL Normal Saline over 15 minutes
- CBC, lytes, urea, Cr and glucose, 12-lead ECG
- ABG after intubation and PRN

**Upon Discharge:**
- Provide patient with an Asthma Patient Discharge Package
- Provide referral to Asthma Clinic/Educator
- The following recommended medications are being prescribed on discharge:
  - Inhaled Salbutamol  
  - Inhaled Ipratropium  
  - Oral corticosteroid  
  - Inhaled corticosteroid  
  - Other ________________________________

Date/Time: _______________  Physician Signature _________________________________ MD
**ACUTE ASTHMA EXACERBATION: PEDIATRIC – CTAS LEVEL 1**

<table>
<thead>
<tr>
<th>CTAS LEVEL 1</th>
<th>Place patient in resuscitation area immediately. Notify physician and RT if available.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>- Obtain peak flow if possible</td>
</tr>
<tr>
<td></td>
<td>- Oxygen to maintain SpO₂ ≥ 95%</td>
</tr>
<tr>
<td></td>
<td>- Salbutamol 5 mg by nebulizer once, then continuous salbutamol 5 mg + ipratropium 0.25</td>
</tr>
<tr>
<td></td>
<td>mg by nebulizer q 30 min</td>
</tr>
<tr>
<td></td>
<td>- Initiate Normal Saline IV at __________ mL/hour</td>
</tr>
<tr>
<td></td>
<td>- Cardiac monitor</td>
</tr>
<tr>
<td></td>
<td>- Pulse oximetry</td>
</tr>
<tr>
<td></td>
<td>- Assess for intubation need (suggested medications below) Patient weight: _______ kg</td>
</tr>
<tr>
<td></td>
<td>☐ Consider pretreatment: midazolam 0.1 mg/kg (________ mg) IV once + atropine 0.02 mg/kg (_______ mg) IV once</td>
</tr>
<tr>
<td></td>
<td>☐ Ketamine 1-2 mg/kg (________ mg) IV once</td>
</tr>
<tr>
<td></td>
<td>☐ Succinylcholine 1.5 mg/kg (________ mg) IV once</td>
</tr>
<tr>
<td></td>
<td>- Methylprednisolone 1-2 mg/kg (________ mg) IV once (maximum dose 125mg)</td>
</tr>
<tr>
<td></td>
<td>- Portable chest x-ray to rule out pneumothorax/ alternate diagnosis</td>
</tr>
<tr>
<td></td>
<td>- If severe exacerbation and poor or no response, consider</td>
</tr>
<tr>
<td></td>
<td>☐ Magnesium 25 mg/kg (________ mg) IV once (maximum dose 2000 mg)</td>
</tr>
<tr>
<td></td>
<td>- CBC, lytes, urea, Cr and glucose</td>
</tr>
<tr>
<td></td>
<td>- ABG after intubation and PRN</td>
</tr>
</tbody>
</table>

**Upon Discharge:**

- Provide patient with an Asthma Patient Discharge Package
- Provide referral to Asthma Clinic/Educator
- The following recommended medications are being prescribed on discharge:
  - ☐ Inhaled Salbutamol
  - ☐ Inhaled Ipratropium
  - ☐ Oral corticosteroid
  - ☐ Inhaled corticosteroid
  - ☐ Other ______________________________________________

Date/Time: ______________   Physician Signature ______________________________________MD
ACUTE ASTHMA EXACERBATION: **ADULT - CTAS LEVEL 2 or 3**

**CTAS LEVEL 2 or 3**

- Obtain peak flow if possible
  - Salbutamol 5 mg and ipratropium 0.5 mg nebulized with air at 6-8 L/min. Nebulize on O₂ at 6-8 L/min if SpO₂ < 92% **OR**
  - Salbutamol 6-8 puffs and ipratropium 4 puffs by MDI with spacer device
- Oxygen to maintain SpO₂ > 92%
- Prednisone 50 mg PO once
- Reassess patient 20 minutes post-initial treatment¹
  - If good response², physician to assess for discharge [(response to be sustained for 60 minutes); indicators listed below]
  - If incomplete response³ or symptoms persist (indicators listed below)
    - Salbutamol 5 mg nebulized q 20 min; may repeat up to 3 times **OR**
    - Salbutamol 6-8 puffs by MDI with spacer device q 20 min; may repeat up to 3 times
- Reassess patient after 3 additional salbutamol treatments¹
  - If good response² – physician to assess for discharge
  - If incomplete response³ or some persistent symptoms, notify physician and continue to give:
    - Salbutamol 5 mg nebulized q 2h and PRN **OR**
    - Salbutamol 6-8 puffs by MDI with spacer device q 2h and PRN
    - Ipratropium 0.5 mg nebulized q 4h **OR**
    - Ipratropium 4 puffs by MDI with spacer device q 4h
- Continue timely reassessment with the decision to admit/discharge in 4–6 hours

**Upon Discharge:**

- Provide patient with an Asthma Patient Discharge Package
- Provide referral to Asthma Clinic/Educator
- The following recommended medications are being prescribed on discharge:
  - Inhaled Salbutamol
  - Inhaled Ipratropium
  - Oral corticosteroid
  - Inhaled corticosteroid
  - Other

¹. Reassessment includes: PEFR, SpO₂, RR, HR, accessory muscle use, Work of Breathing, and auscultation.
². Good response is indicated by the following: PEFR > 60% of patient’s normal/predicted, SpO₂ > 92%, no distress, respirations are normal, minimal wheeze, free of retractions, colour good, and anxiety managed.
³. Incomplete response is indicated by PEFR 40-60% of patient’s normal/predicted, signs, symptoms, and SpO₂ not improving.
### Physician’s Order

#### ACUTE ASTHMA EXACERBATION: PEDIATRIC - CTAS LEVEL 2 or 3

<table>
<thead>
<tr>
<th>CTAS LEVEL 2 or 3</th>
<th>Time/ RN Initial</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Obtain peak flow if possible</td>
<td></td>
</tr>
<tr>
<td>□ Salbutamol 5 mg nebulized with $O_2$ at 6-8 L/min  <strong>OR</strong></td>
<td></td>
</tr>
<tr>
<td>□ Salbutamol 6-8 puffs by MDI with spacer device</td>
<td></td>
</tr>
<tr>
<td>• Oxygen to maintain $SpO_2 &gt; 92%$</td>
<td></td>
</tr>
<tr>
<td>• Prednisolone 1 mg/kg (_______mg) PO unless contraindicated (to a max of 50 mg)</td>
<td></td>
</tr>
<tr>
<td><strong>OR</strong> Dexamethasone 0.2 mg/kg (_______ mg) PO, once</td>
<td></td>
</tr>
<tr>
<td>• Reassess patient 10 minutes post-initial treatment$^1$</td>
<td></td>
</tr>
<tr>
<td>• If good response$^2$, physician to assess for discharge [(response to be sustained for 60 minutes); indicators listed below]</td>
<td></td>
</tr>
<tr>
<td>• If incomplete response$^3$ or symptoms persist (indicators listed below)</td>
<td></td>
</tr>
<tr>
<td>□ Salbutamol 5 mg nebulized q 20 min PRN; may repeat up to 3 times <strong>OR</strong></td>
<td></td>
</tr>
<tr>
<td>□ Salbutamol 6-8 puffs by MDI with spacer device q 20 min PRN; may repeat up to 3 times</td>
<td></td>
</tr>
<tr>
<td>• Reassess patient after 3 additional salbutamol treatments$^1$</td>
<td></td>
</tr>
<tr>
<td>• If good response$^2$ – physician to assess for discharge</td>
<td></td>
</tr>
<tr>
<td>• If incomplete response$^3$ or some persistent symptoms, notify physician and continue to give:</td>
<td></td>
</tr>
<tr>
<td>□ Salbutamol 5 mg nebulized q 2h and PRN  <strong>OR</strong></td>
<td></td>
</tr>
<tr>
<td>□ Salbutamol 6-8 puffs by MDI with spacer device q 2h and PRN</td>
<td></td>
</tr>
<tr>
<td>□ Ipratropium 0.25 mg nebulized q 4h  <strong>OR</strong></td>
<td></td>
</tr>
<tr>
<td>□ Ipratropium 2 puffs by MDI with spacer device q 4h</td>
<td></td>
</tr>
<tr>
<td>• Continue timely reassessment with the decision to admit/discharge in 4–6 hours</td>
<td></td>
</tr>
</tbody>
</table>

#### Upon Discharge:

- Provide patient with an Asthma Patient Discharge Package
- Provide referral to Asthma Clinic/Educator
- The following recommended medications are being prescribed on discharge:
  - □ Inhaled Salbutamol
  - □ Inhaled Ipratropium
  - □ Oral corticosteroid
  - □ Inhaled corticosteroid
  - □ Other

---

4. Reassessment includes: PEFR, $SpO_2$, RR, HR, accessory muscle use, Work of Breathing, and auscultation.
5. Good response is indicated by the following: PEFR > 60% of patient’s normal/predicted, $SpO_2 > 92\%$, no distress, respirations are normal, minimal wheeze, free of retractions, colour good, and anxiety managed.
6. Incomplete response is indicated by PEFR 40-60% of patient’s normal/predicted, signs, symptoms, and $SpO_2$ not improving.
**DATE:**  
**TIME:**

**Triage (please circle):**  
2  
3

**CTAS Level 2 (Severe):** Short of breath while talking, SP02 92-94%, PEFR 40-60% Normal/Predicted

**CTAS Level 3 (Mild/Moderate):** Talking in sentences, SP02 > 95%, PEFR > 60% Normal/Predicted

**PEFR on Admission:** lpm  
**PEFR Normal:** lpm

**Initial Assessment:** RR________ HR________ SP02________ on _____ work of breathing: ↑ or ↓

Auscultation:

Work of breathing:

**Treatment/Reassessment in ED:**

<table>
<thead>
<tr>
<th>Time</th>
<th>Medication</th>
<th>Dose</th>
<th>Route</th>
<th>Initials</th>
<th>PEFR</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Salbutamol / Ipratropium Bromide</td>
<td>Neb/MDI</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Prednisone/ Prednisolone / Dexamethasone</td>
<td>(Circle 1)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Reassessment: RR________ HR________ SP02________ on _____ work of breathing: ↑ or ↓

Auscultation:

Salbutamol / Ipratropium Bromide Neb/MDI

Reassessment: RR________ HR________ SP02________ on _____ work of breathing: ↑ or ↓

Auscultation:

Salbutamol / Ipratropium Bromide Neb/MDI

Reassessment: RR________ HR________ SP02________ on _____ work of breathing: ↑ or ↓

Auscultation:

Salbutamol / Ipratropium Bromide Neb/MDI

Reassessment: RR________ HR________ SP02________ on _____ work of breathing: ↑ or ↓

Auscultation:

Salbutamol / Ipratropium Bromide Neb/MDI

Reassessment: RR________ HR________ SP02________ on _____ work of breathing: ↑ or ↓

Auscultation:
# DISCHARGE PLAN

<table>
<thead>
<tr>
<th>Patient Admitted</th>
<th>Y</th>
<th>N</th>
<th>Discharge Date/Time</th>
<th>/</th>
</tr>
</thead>
<tbody>
<tr>
<td>Referral to Asthma Clinic</td>
<td>Y</td>
<td>N</td>
<td>If NO, reason patient not referred to clinic</td>
<td></td>
</tr>
</tbody>
</table>

# PRESCRIPTION GIVEN ON DISCHARGE

<table>
<thead>
<tr>
<th>Medication</th>
<th>Device</th>
<th>Dose/Frequency</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Salbutamol</td>
<td>Y</td>
<td>N</td>
<td></td>
</tr>
<tr>
<td>2. Ipratropium Bromide</td>
<td>Y</td>
<td>N</td>
<td></td>
</tr>
<tr>
<td>3. Oral Corticosteroid</td>
<td>Y</td>
<td>N</td>
<td></td>
</tr>
<tr>
<td>4. Inhaled Corticosteroid</td>
<td>Y</td>
<td>N</td>
<td></td>
</tr>
<tr>
<td>5. Other</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

# TEACHING

<table>
<thead>
<tr>
<th>Teaching</th>
<th>Device</th>
<th>Given by</th>
<th>Done by</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Discharge pamphlet given</td>
<td>Y</td>
<td>N</td>
<td></td>
<td>RT RN</td>
</tr>
<tr>
<td>Discharge instructions done</td>
<td>Y</td>
<td>N</td>
<td></td>
<td>RT RN</td>
</tr>
<tr>
<td>Device Teaching done</td>
<td>Y</td>
<td>N</td>
<td></td>
<td>RT RN</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Spacer Device: Pt. Already has one?</th>
<th>Y</th>
<th>N</th>
<th>Purchased?</th>
<th>Y</th>
<th>N</th>
</tr>
</thead>
</table>
How to deliver Bronchodilators via Metered Dose Inhaler (MDI) with Spacer

1. Remove the caps from the MDI and spacer device. Shake the MDI well.

2. Insert the MDI into the open end of the spacer, which is opposite the mouthpiece.

3. Ask the patient to breathe out completely.

4. Place the mouthpiece of the spacer between the patients’ teeth and ask them to seal their lips tightly around it.

5. Press the canister once to release the medicine. The medicine will be trapped in the spacer.

6. Ask the patient to breathe in slowly and completely through their mouth. With some spacers, you will hear a horn-like sound if the patient is inhaling too quickly. This means the patient needs to slow down their next inhalation.

7. Ask the patient to hold their breath for at least 10 seconds to allow the medication to deposit in your lungs. Counting out loud can help.

8. Wait for 30 seconds to one minute and then repeat Steps 1-7 for every puff of medication ordered.

9. Replace the caps on your MDI and spacer when finished.
F. Asthma Patient Discharge Information

On discharge, patient should be provided with discharge instructions and patient education materials as determined by your site. The following include:

- **Discharge Instructions for Adults with Asthma**
- **Discharge Instructions for Children with Asthma**
- **Patient Education Materials and Ordering Information**

  VCH recommended Patient Education Materials
  - **Adults**
    - Triggers – Managing your Environment*
    - Medications – Use as Prescribed*
    - Diagnosis – Do you Have Asthma? Get the answers*
  - **Children**
    - Kids – Be a Secret Asthma Agent*
    - Action Asthma
    - Asthma in Children

A copy of each brochure is included in the Appendix section in this binder.

* These brochures are available in English, French and Chinese.
## Discharge Instructions for Adults with Asthma

### General Information
When you are discharged home, you may be given a prescription from the Emergency doctor. Follow the instructions carefully. Before leaving the Emergency Department make sure you understand what medication to take and when to take it.

It can be hard to decide when to go to hospital for asthma treatment. If you are concerned, or have any of the warning signs listed in this brochure, have someone take you into the Emergency Department right away, or call an ambulance.

### Instructions:
Even if you continue to do well on the medication prescribed, visit your family doctor within 24 to 48 hours after discharge from the Emergency Department.

**If you are concerned, you should get advice early rather than waiting until an episode is severe. Seek help very early if you have had a severe asthma episode in the past.**

### Seek Medical Help if you experience the following:
- Shortness of breath and wheezing at rest.
- Difficulty walking or talking due to shortness of breath.
- PEF (peak expiratory flow) <50% of baseline and does not increase 15 minutes after bronchodilator medication.
- Needing relief from a bronchodilator medication every 2 or 3 hours.
- Feeling faint or frightened.

### Call an Ambulance if you experience any of the following warning signs:
- Sudden onset of severe shortness of breath, wheezing, coughing and chest tightness.
- No relief from your reliever medication.
- Difficulty speaking.
- If your lips or fingers are turning blue.
# Discharge Instructions for Children with Asthma

## General Information
If your child gets relief from the medication prescribed while in Emergency, the doctor will ask you to give your child the same type of medication at home. Follow the instructions carefully. See your family doctor within 24 to 48 hours.

It can be hard for you, as a parent, to tell if your child should be taken back to the hospital. If you are concerned, or if your child has any of the warning signs listed in this brochure, bring him/her to the Emergency Department right away, or call an ambulance, rather than let the asthma get out of hand.

## Instructions:
Even if your child continues to do well on the medication prescribed, be sure you take him/her to your family doctor within 24 to 48 hours after discharge from the Emergency Department.

**If you are concerned, you should get advice early rather than waiting until an episode is severe. Seek help very early if your child has had a severe asthma episode in the past.**

Go to Emergency or Call 911 if your child experiences the following:
- Faster than normal breathing
- Increased shortness of breath
- Tiredness caused by the hard work of breathing
- Skin around the neck and between the ribs is pulled in with breathing (indrawing)
- For children whose peak flow values are measured, watch for values which are dropping or not coming back to normal after medication
- If you hear a wheeze, bring your child back to the hospital. It could be a sign that your child’s asthma is worsening. However, do not rely on this sign alone. With severe asthma there may be no wheeze.
- Other symptoms present such as fever or vomiting

**If your child’s lips or fingers are turning blue and/or your child cannot speak, this is a late warning sign. Call an ambulance immediately.**
# Patient Education Materials and Ordering Information

## Adult Asthma Education Materials

<table>
<thead>
<tr>
<th>Topic</th>
<th>Source</th>
</tr>
</thead>
</table>
| Managing your Environment | Asthma Society of Canada  
Diane Johnson  
PHONE: 1– 866-787-4050, ext 100  
EMAIL: dianne@asthma.ca |
| Medications – Use as Prescribed | 
| Do you Have Asthma? Get the answers | 

## Youth Asthma Education Materials

<table>
<thead>
<tr>
<th>Topic</th>
<th>Source</th>
</tr>
</thead>
</table>
| Kids – Be a Secret Asthma Agent | Asthma Society of Canada  
Diane Johnson  
PHONE: 1– 866-787-4050, ext 100  
EMAIL: dianne@asthma.ca |
| Action Asthma | 
| Asthma in Children | BC Lung Association  
Kelly Ablog-Morrant  
Director of Health Education and Program Services  
PHONE: 604 – 731 – 5864  
FAX: 604 – 731 – 5810  
EMAIL: ablog@bc.lung.ca |
| Using an Inhaler – coloured poster – RESPIRONICS ORDER | Respironics – Order #1011349  
1-800-345-6443 Select International |

Asthma Society of Canada brochures are available in English, French and Chinese.
G. Appendix

- Asthma Reference Materials
- Patient Education Materials