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| **Case Title**  | Severe Pediatric Asthma |
| **Scenario Name** | SImmit Workshop |

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| **Learning Objectives -** [**Use action words**](http://ubccpd.ca/sites/ubccpd.ca/files/Accreditation_Learning%20Objectives_%20Verbs.pdf) |
| **Knowledge:**1. Describe treatment options for a pediatric patient with severe asthma exacerbation
2. Recognize the complications of mechanical ventilation and the importance of exhausting less invasive means first
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| **Skills:**1. Demonstrate effective management of pediatric asthma
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| **Attitude/Behaviours:**1. Demonstrate Team skills
2. Demonstrate Situational awareness
3. Demonstrate Graded Assertiveness
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| **Scenario Environment** |
| **Location** | ED |
| **Monitors** | Cardiac, BP, SpO2 monitor |
| **Props/Equipment** | Medications, IO, IV supplies, intubation equipment, ETT, BVM, Broselow tapeIH Pediatric Asthma PPOs, Oxygen therapy sheet |
| **Make-up/Moulage** | None |
| **Potential Distractors** | Distraught parent |

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| **Case Introduction:** |
| 6 year old male who came into ED with severe shortness of breath. Child is in distress, speaks only in words, and is agitated.  |

| **Patient Parameters** | **Effective Management** | **Notes** |
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| **Phase 1: Severe Respiratory Distress****Condition:** The child has increased work of breathing, speaks only in words, unable to speak in sentences. He is agitated. All accessory muscles involved with nasal flaring. **Initial Assessment*** **Heart Rhythm:** Sinus Tachycardia
* **HR:** 135
* **BP:** 90/60
* **RR:** 38
* **SP02:** 91% on RA
* **T:**  37.5
* **Glucose:** 6.0
* **CNS:** Agitated
* **Chest:** Audible wheezing, widespread decreased A/E
* **CVS:** cap refill 3 secs
* **Weight:** 20 kg
 | 1. **Take a focused history** (see Notes column)
2. **Medical Management**

**Airway/Breathing*** Calculate PRAM Score = 11

*O2 saturation - 2**Suprasternal indrawing present-2**scalene retractions present-2**Audible wheezing-3**A/E widespread decrease-2** Keep O2 sats >92%, consider 100% O2
* Continuous cardiac and O2 sats monitor
* Nebulized Ventolin 5 mg at 6-8L O2/min, repeat continuously until PRAM <8.
* Nebulized Ipatropium 500 mcg q20min up to 3 doses
* Methylprednisolone 1 mg/kg then 1 mg/kg/day divided q6h (max 60 mg/day)
* Consider IV magnesium sulfate

 **Circulation*** Consider IV fluid bolus 10-20 mL/kg
* Obtain IV access

 **Diagnostics/Disposition*** Call for help
* Capillary (or arterial or venous) blood gas
* Portable CXR
* Keep patient NPO

**Consequences of ineffective management*** *Progress to Phase 2 (Impending Respiratory Failure) if management not sufficient/ rapid*
* *Progress to Phase 3 (Condition Improvement) if managed sufficiently*
 | 1. **Focused history**
* 2 day history of URI symptoms that worsened abruptly yesterday morning

**PMHx*** Asthma
* 2 hospital admissions last year, 1 to PICU without need for intubation
* Immunizations up to date

**Home Meds*** Ventolin MDI
* Flovent (but mom stopped it last month because he was “doing better”)

**Allergies*** NKDA
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| **Phase 2: Impending Respiratory Failure****Condition:** Becomes drowsy and confused. Unable to speak. Marked respiratory distress at rest with all accessory muscles involved. Silent chest. **Physical Examination*** **Heart Rhythm:** Sinus (progressing to bradycardia)
* **HR:**  90🡪60
* **BP:** 78/56
* **RR:** 8
* **SP02:** 88%
* **T:** Unchanged
* **CNS:** Confused and drowsy, declining LOC
* **Chest:** Silent chest
* **CVS:** cap refill 5 secs
 | 1. **Patient Reassessment** (see Notes column)
2. **Medical Management**

**Airway/Breathing*** Reassess PRAM Score = 12 (addition of absent A/E)
* BMV Mask at 15/min with 100% O2
* Continuous aerosolized salbutamol
* IV MgS04 if not yet given

 **Circulation*** Keep NPO and ensure IV access
* Continuous cardiac and O2 sats monitor

 **Diagnostics/Disposition*** Draw blood for gases and electrolytes
* Call ICU and/or Anesthesia Physician

***Consider:**** High flow, BiPAP
* IV aminophylline or IV salbutamol
* IV/SC epinephrine
* Rapid Sequence Intubation
 | 1. **Patient Reassessment**

**Airway*** Decreased LOC, threatened airway

**Breathing** * Decreased RR, silent chest

**Circulation*** Progressing to bradycardia, hypotensive for age (SBP <70 + [2 x age in years])
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| **Phase 3: Condition Improvement****Condition:** With adequate ventilation (could be either bipap or intubation) Improved mentation and alertness. Decreased respiratory effort. Improved oxygenation and heart rate. Wheeze remains, but decreased. **Physical Examination*** **Heart Rhythm:** Sinus Tachycardia
* **HR:**  125
* **BP:** 92/62
* **RR:** 32
* **SP02:** 94%
* **T:** Unchanged
* **CNS:** Improved LOC
* **Chest:** A/E throughout with expiratory wheeze present
* **CVS:** cap refill 3 secs
 | 1. **Patient Reassessment** (see Notes column)
2. **Medical Management**

 **Airway/Breathing*** Reassess PRAM Score = 5

*Suprasternal indrawing present-2**Scalene retractions present-2**Expiratory wheezing-1**Normal A/E-0** Keep O2 sats >94%,
* Ventolin +/- ipratropium q20 min x 3 doses (if not yet done)
* Give steroids (if not yet done)

 **Disposition*** Consult Pediatrician
 | 1. **Patient Reassessment**

**Airway*** Protected

**Breathing** * Improved O2 sats, RR, and effort

**Circulation*** Improved pulse and BP
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| **Phase 4: Pneumothorax****Condition:** Patient again becomes hypoxic with increased WOB **Physical Examination*** **Heart Rhythm:** Sinus Tachycardia
* **HR:**  130
* **BP:** 92/62
* **RR:** 32
* **SP02:** 82%
* **T:** Unchanged
* **CNS:** Becoming less responsive
* **Chest:** A/E decreased on L side.
* **VS:** cap refill 3 secs
 | 1. **Patient Reassessment** (see Notes column)
2. **Medical Management**

 **Airway/Breathing*** Reassess PRAM Score = 5

*Suprasternal indrawing present-2**Scalene retractions present-2**Expiratory wheezing-1**Normal A/E-0** Keep O2 sats >94%,
* Consider “DOPE” pneumonic
* Needle/finger decompress and set up chest tube

**Disposition*** Consult PICU
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**Insert more lines if more phases required.**

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| **Expected Patient Management** | **Debriefing Points** |
| Notes:IV on second attempt |  |

**References:**

Canadian Peadiatric Society (2015). Managing the paediatric patient with an acute asthma exacerbation. *Paediatric Child Health, 17*(5), 251-255.

Obtained from: [management-acute-asthma-exacerbation.pdf](file://dc1serv10/users%24/S/slij/management-acute-asthma-exacerbation.pdf)

Ducharme et al. (2015). Diagnosis and management of asthma in preschoolers: A Canadian Thoracic Society and Canadian Paediatric Society position paper. *Canadian Respiratory Journal, 22*(3), 135-143. Obtained from: [2015\_CTS-CPS\_Diagnosis\_Management\_Asthma\_Preschoolers.pdf](file://dc1serv10/users%24/S/slij/2015_CTS-CPS_Diagnosis_Management_Asthma_Preschoolers.pdf)