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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 | |
| **Skills:**   1. Demonstrate effective management of pediatric asthma | |
| **Attitude/Behaviours:**   1. Demonstrate Team skills 2. Demonstrate Situational awareness 3. Demonstrate Graded Assertiveness | |
| **Scenario Environment** | |
| **Location** | ED |
| **Monitors** | Cardiac, BP, SpO2 monitor |
| **Props/Equipment** | Medications, IO, IV supplies, intubation equipment, ETT, BVM, Broselow tape  IH 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 |
| **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]) |
| **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 |
| **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 |  |

**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$/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$/S/slij/2015_CTS-CPS_Diagnosis_Management_Asthma_Preschoolers.pdf)