Western Dakota Tech
Registered Nursing Program
NURS 270 Maternal-Child Nursing
**Pediatric Simulation**

**Objectives:**
1. Identify and demonstrate management of a child with severe exacerbation of asthma. (CLO 5)
2. Recognize the signs and symptoms of severe exacerbation of asthma. (CLO 3)
3. Recognize the nursing considerations related to medication used in asthma management. (CLO 7)
4. Identify and interpret the appropriate diagnostic tests associated with severe asthma management. (CLO 8)
5. Recognize the complications of ineffective treatment of severe asthma and long-term effects. (CLO 3)
6. Identify the use of mechanical ventilation in impending respiratory failure. (CLO 8)

**Pre-Sim** (45 minutes-1 hour)
1. Read objectives listed above to students.

2. Discuss pre-sim questions with students. Allow all to contribute to answers.
    a. What factors might trigger an asthmatic episode?
    b. What are the clinical manifestations of a pediatric patient experiencing an exacerbation of asthma?
    c. Explain the progression of asthma that is non-responsive to treatment.
    d. Discuss the pathophysiology of asthma.
    e. Discuss the following treatment modalities for the treatment of asthma and note when each is indicated: aerosolized medications by nebulizer, metered-dose inhaler, oxygen, heliox therapy, and BiPAP.
    f. What would be a priority nursing diagnosis?
    g. What diagnostics would you expect the physician to order?
    h. What would the treatment plan be for status asthmaticus?
    i. Discuss consent for treatment of a minor. How does the nurse proceed of the parent is unreachable?

3. **Give SBAR report** to students on patient:
    a. Michael Huggins (DOB 12/5/2014) is an eight-year-old male who was brought to the ED by his mother because he is wheezing. The mother reports the child has asthma and has been experiencing increasing shortness of breath for the past two days. The peak expiratory flow value was between 50%-80%. The mother has been giving him nebulizer treatments more frequently, but reports he is still wheezing. The patient was born prematurely at 32 weeks. He was on a ventilator in the NICU for two to three weeks. He has a history of reactive airway disease as an infant. He has been treated at home with albuterol, salmeterol xinafoate inhaler and fluticasone. This is his third admission to the ED, but he has never been admitted to the hospital unit.
    b. Assessment:
        i. Vital Signs: HR 110, BP 120/70, RR 30, $SpO_2$ has been 92% on room air, Temperature 37C
        ii. General Appearance: Well-nourished child. Appears stated age. Appears anxious and in moderate respiratory distress
        iii. Cardiovascular: Sinus tachycardia
        iv. Respiratory: Wheezes in lower lobes
        v. GI: Active bowel sounds
        vi. GU: Has not voided
        vii. Extremities: Movement equal bilaterally

viii. Skin: Warm, dry and pale. Adequate turgor
ix. Neurological: Alert and oriented to person, place and time. Pupils equal, round, reactive to light and accommodation. No neurological deficits. Slightly agitated
x. Pain: Denies pain
xi. Recommendations: Complete an initial assessment and initiate the admission orders.

4. Break students into groups of three or four, then have students draw roles.
    a. Primary nurse
    b. Secondary nurse (or family member if you would like)
    c. Medication nurse
    d. LPN/CNA (leave this one out if group of 3 students)
5. Read the pre-sim information provided on the laminated sheets within the debrief room that you have not already discussed with the students.
    a. Take students into simulation room to allow them to look around, find supplies, ask questions about the simulator, etc.
6. Bathroom break.
7. Pull up video screen in debrief room for students to watch.
    a. Roger or Krista will set up for you.
8. Begin simulation with first group of 4 students.

**Sim** (total of 2.5-3 hours, including debriefing time)

1. Run through State 1 and State 2 of the scenario with the first group of students as written (30-45 minutes).

    a. **State 1**: the patient demonstrates a HR in the 110s, BP in the 110s/70s, RR in the high 20s, SpO2 in the low 90s on room air and a temperature of 37C. His weight is 20 kg, and his height is 115 cm. Wheezes are heard throughout the lower lobes, and he is breathless after walking to the exam room. There are no intercostal or substernal retractions. His skin is warm, dry and pale. His pupils are equal and reactive to light and accommodation. The peak flow reading is 76%. The learners are expected to obtain a history of the illness from the mother. Findings include that the patient has a new kitten and the mother smokes. The learners are expected to complete the initial assessment, obtain oxygen saturation and peak flow readings, evaluate the data and provide rationale for the abnormal findings. The learners are expected to identify the patient's developmental level and communicate and care for the patient based on those findings. The learners are expected to notify the healthcare provider of the findings.
        i. **State 1 Orders**:
            1. Albuterol 0.6 mL (5 mg/mL) at 0.083% concentration in 3 mL of normal saline via nebulizer every 20 minutes x 3 doses
            2. Prednisolone 1 mg/kg PO once STAT
            3. Notify the healthcare provider of the patient's status after completion of the albuterol treatment and for any acute changes in condition
    b. After new orders are received, the learners are expected to administer the albuterol nebulizer treatment up to 3 times, 20 minutes apart and administer the prednisolone (1 mg x kg = 20 mg = 6.7 mL). After the medications are administered, the facilitator should advance the SCE to State 2 Improvement After Nebulizers.

    c. **State 2**: the patient demonstrates a HR in the 120s to 130s, BP in the 100s/60s, RR in the low 20s, SpO2 in the mid 90s on room air and temperature of 37C. Breath sounds are clear, and his bowel sounds are slightly hyperactive. His skin is warm, dry and pale. There are no intercostal or substernal retractions.

Peak flow reading is 88%. He is alert and talkative. The learners should repeat a focused assessment, evaluate the peak flow results and notify the healthcare provider of the improvement in condition.

i. **State 2 Orders**:
    1. Discharge patient to home
    2. Continue usual home management of asthma and begin prednisolone 20 mg PO twice per day

2. Discharge orders are obtained that include instructions to continue her usual home management and begin prednisolone 20 mg by mouth twice a day. The learners are expected to communicate appropriately with the patient and mother and provide additional discharge teaching that includes increasing fluid intake, recognition of the signs and symptoms that prompt a return to the ED, use of peak flow meter, prednisolone administration and avoidance of triggers.
    a. Once students complete discharge teaching, pause the simulation and meet back in the debrief room with all students.

3. **Debrief Questions** (approximately 1.5-2 times longer than the simulation lasted):
    a. What was the experience like for you?
    b. What happened and why?
    c. What did you do and was it effective?
    d. Discuss your interventions (technical and non-technical). Were they performed appropriately and in a timely manner?
    e. How did you decide on your priorities for care and what would you change?
    f. How did patient safety concerns influence your care? What did you overlook?
    g. In what ways did you personalize your care for this patient and family members (recognition of culture, concerns, anxiety)?
    h. Discuss your teamwork. How did you communicate and collaborate? What worked, what didn't work, and what will you do differently next time?
    i. What are you going to take away from this experience?

4. Have the first group of students give SBAR report to the second group of students.

5. Second group of students begin State 3 and State 4 of the scenario while first group is watching in the debrief room.
    a. First group of students can be part of the "code team" if needed.
    b. Several hours later after his discharge, a 16-year-old babysitter brings the child to the ED because "he's having trouble breathing."

    c. **State 3**: the patient demonstrates a HR in the 150s, BP in the 110/80s, RR in the mid 30s, SpO2 in the high 80s on room air and a temperature of 37.6C. He exhibits audible inspiratory and expiratory wheezes, and breath sounds reveal wheezes in both upper and lower lung fields. There is use of accessory muscles to breathe with both intercostal and substernal retractions. Nasal flaring and circumoral cyanosis are also present. His cardiac rhythm reveals sinus tachycardia. His skin is warm, moist, and pale. His eyes are glassy and filled with tears. His facial expression is anxious, and there is decreased verbalization. His mother did not accompany the patient, and the babysitter reports that she did not give him any nebulizer treatments. An IV was placed by the triage nurse upon presentation to the ED. The learners are expected to complete an assessment, evaluate the data, identify the changes in the patient's condition and document the findings. The learners should allow the patient to remain in a position of comfort and evaluate the peak flow reading which is in the red area (less than 50%). The learners are expected to notify the healthcare provider of changes in assessment, initiate attempts to find the patient's mother, provide reassurance to the babysitter and identify concerns about consent for treatment of a minor. In addition, the learners are to provide age-appropriate communication and reassurance to the patient.

i. **State 3 Orders**:
    1. Diagnosis: Asthma exacerbation
    2. Full code
    3. Vital signs per ED routine
    4. Obtain arterial blood gases STAT
    5. Apply oxygen via non-rebreather mask at 70% FiO2
    6. Albuterol 0.6 mL (5 mg/mL) in 0.083% concentration in 1 mL (0.25 mg/mL) Ipratropium bromide per nebulizer every 20 minutes x 3 doses
    7. Methylprednisolone 20 mg via IV push x 1 loading dose, then 10 mg every 6 hours
    8. Start IV of NS at 50 mL/kg/24 hours

d. After orders are received, the learners are expected to ensure the blood gas is drawn, apply oxygen per non-rebreather facemask, administer the first dose of nebulizer treatments, administer methylprednisolone and initiate IV fluid administration.

e. **State 4**: the patient is worsening with a HR in the 120s, BP in the 120s/70s, RR in the low to mid 30s and SpO2 in the low 90s on oxygen at 70% via a non-rebreather mask. His breath sounds are decreased and muffled with decreased wheezing. There are intercostal, substernal and supraclavicular retractions. Nasal flaring, circumoral nail bed cyanosis and sluggish capillary refill are present. His lips and mucous membranes are dry. His eyes have a glassy appearance. He is awake but sleepy. There is no urinary output. The learners are expected to repeat a focused assessment, evaluate the data and identify worsening of the condition. The learners should allow the patient to remain in a position of comfort and provide age-appropriate communication and reassurance. When the learners request the ABG results, the facilitator should provide the following report: ABG: pH 7.30, PaO2 62 mmHg, PaCO2 38 mmHg, HCO3 22 mmol/L, O2 saturation 90%. The learners should correctly determine the nebulizer dose and administer subsequent doses of albuterol and ipratropium according to the Six Rights. The learners are expected to re-evaluate the pulse oximetry, interpret results and regulate the oxygen to keep saturation greater than 94%. The learners are expected to continue attempts to find the mother and notify the healthcare provider of the patient's worsening condition.

i. **State 4 Orders**:
    1. Admit to PICU
    2. Diagnosis: Status asthamticus
    3. Full code
    4. Continuous ECG and SpO2 monitoring
    5. Oxygen at 70% via non-rebreather mask
    6. Continue IV NS at 50 mL/hour
    7. Albuterol 0.6 mL (5 mg/mL) at 0.083% concentration in 1 mL of ipratropium bromide (0.25 mg/mL) via nebulizer continuously
    8. CBC, electrolytes, magnesium, urinalysis STAT
    9. ABG in PICU
    10. ECG STAT
    11. Portable chest x-ray STAT
    12. Consult Child Life Services

    f. The learner receives new orders including admitting the patient to the Pediatric Intensive Care Unit (PICU). The learners are expected to arrange for lab and diagnostic tests to be performed, notify Respiratory Therapy of continuous nebulizer treatments and begin therapy. The learners should also provide the hand-off report to the PICU nurse using SBAR and use a bag-valve-mask device during transport of the patient to PICU.
6. Once the students reach the end of the scenario, end the simulation and meet back in the debrief room with all students.

7. **Debrief Questions** (approximately 1.5-2 times longer than the simulation lasted):
    a. What was the experience like for you?
    b. What happened and why?
    c. What did you do and was it effective?
    d. Discuss your interventions (technical and non-technical). Were they performed appropriately and in a timely manner?
    e. How did you decide on your priorities for care and what would you change?
    f. How did patient safety concerns influence your care? What did you overlook?
    g. In what ways did you personalize your care for this patient and family members (recognition of culture, concerns, anxiety)?
    h. Discuss your teamwork. How did you communicate and collaborate? What worked, what didn't work, and what will you do differently next time?
    i. What are you going to take away from this experience?

**Post-Sim**

1. Have students fill out the SET-M survey regarding the simulation prior to them leaving for the day.
    a. Found on all the tables in the debrief rooms.
    b. Place completed forms in the appropriately labeled basket at the main nurse's station.
2. Enter attendance for students.
    a. "Present" if attended sim on time.
    b. "Tardy" if late to sim.
    c. "Absent – Unexcused" if non at sim.
    d. "Absent – Excused" if in a different sim group not scheduled for that day.
3. Enter grades for students.