

Medications

- Budesonide-formoterol fumarate (Symbicort) 160/4.5 mcg inhaler. 2 puffs oral inhalation, BID.
Pharmacological class: Corticosteroid (Jones & Bartlett Learning, 2023).
Therapeutic class: Anti-asthmatic, anti-inflammatory (Jones & Bartlett Learning, 2023).
Nursing assessment: Assess respiratory rate and oxygen saturation before and after administration, and monitor for adverse reactions such as hypertension and oral infections (Jones & Bartlett Learning, 2023). Due to the impact of corticosteroids on the immune system, also monitoring for signs of infection and WBC count (Jones & Bartlett Learning, 2023).
- Ipratropium-albuterol (DuoNeb) 0.5-2.5 (3) mg/3 mL nebulizer solution 3 mL, oral inhalation, four times per day.
Pharmacological class: Anticholinergic (Jones & Bartlett Learning, 2023).
Therapeutic class: Bronchodilator (Jones & Bartlett Learning, 2023).
Nursing assessment: Monitor for oral fungal infections and atrial fibrillation as an adverse reaction (Jones & Bartlett Learning, 2023).
- methylprednisolone (Solu-Medrol) IV injection, 60 mg every 12 hours.
Pharmacological class: Glucocorticoid (Jones & Bartlett Learning, 2023).
Therapeutic class: Corticosteroid (Jones & Bartlett Learning, 2023).
Nursing assessment: Monitor for signs of infection and regularly assess mental health. Also, monitoring thyroid function as it can impact drug effectiveness (Jones & Bartlett Learning, 2023). Due to the impact on the immune system, also monitoring for signs of infection and WBC count (Jones & Bartlett Learning, 2023).
- montelukast (Singulair) 10mg oral tablet, once daily in the evening.
Pharmacologic class: Leukotriene receptor antagonist (Jones & Bartlett Learning, 2023).
Therapeutic class: Anti-allergen, anti-asthmatic (Jones & Bartlett Learning, 2023).
Nursing assessment: Monitor cardiac and respiratory function and mental health/suicidal ideation (Jones & Bartlett Learning, 2023).

Demographic Data

Date of Admission: 1/26/2024
Admission Diagnosis/Chief Complaint: Asthma exacerbation/Chest tightness
Age: 44
Gender: M
Race/Ethnicity: White/Caucasian, Non-Hispanic
Allergies: No known allergies
Code Status: FULL
Height in cm: 195.6 cm
Weight in kg: 124.7 kg
Psychosocial Developmental Stage: Generativity v. Stagnation
Cognitive Developmental Stage: The Formal Operational Stage
Braden Score: 22
Morse Fall Score: 35- Low risk
Infection Control Precautions: None at this time

Pathophysiology

Disease process: Asthma is commonly brought on by an allergy, chemical, exercise or a virus. The immune system mediates a response during asthmatic exacerbation in which helper T lymphocytes become activated from microbes or allergens and subsequently cause a reaction (Capriotti, 2020). They begin the asthmatic pathway converting B cells to cells that produce IgE antibodies, the immediate allergy responder, and draw in mast cells and eosinophils to help propagate the immune response of inflammation (Capriotti, 2020). The IgE antibodies and mast cells then pair to initiate the release of histamine and leukotrienes, which further inflammatory and bronchoconstriction responses, as well as mucus production (Capriotti, 2020). These actions aim to trap allergens or microbes that are causing the reaction, and increase blood flow to the affected area to fight off the intruder (Capriotti, 2020). The inflammation of the bronchus, subsequent secretions, and spasms that occur bring about the asthmatic symptoms we recognize, such as dyspnea, coughing, wheezing, and others (Capriotti, 2020). As the bronchus undergoes rapid activation during an episode, it becomes changed in shape and can become less reactive over time, which could cause a more rigid airway (Capriotti, 2020). As a result of the bronchoconstriction, there is a decreased exchange of oxygen and carbon dioxide, so systemic perfusion may be diminished and the cardiac and respiratory system will work harder to compensate for this decreased oxygenation.

S/S of disease: Some common signs and symptoms I would expect to see in a client with asthma are tightness in the chest, breathing difficulty, coughing, and wheezing (Capriotti, 2020). Additionally, we may see accessory muscle use, hear wheezing or Ronchi over the lungs, and potentially see a decreased oxygen saturation due to poor perfusion as a result of the constriction of the airways (Capriotti, 2020). Another sign I would associate with asthma is increased respiratory rate, due to inadequate oxygenation. All of these are signs and symptoms seen in this patient.

Method of Diagnosis: In order to diagnose a client with asthma, a provider will evaluate the client's physical assessment, as well as their history and labs (Capriotti, 2020). Then, if asthma is suspected, the client will undergo a pulmonary function test, or PFT (Capriotti, 2020). This test looks at the ratio of a client's forced expiratory volume, or the amount of air expired by force in 1 sec, to their forced vital capacity, the amount of air they can force out of their lungs after a large inhalation (Capriotti, 2020). During an episode of asthma, the forced expiratory volume will be decreased, because the client won't move air as quickly through the constricted airway (Capriotti, 2020). This would thereby lower the ratio of the forced expiratory volume to the forced vital capacity and then a bronchodilator will be administered and the measurements will be retaken (Capriotti, 2020). A client is considered asthmatic when there is a 12% or more improvement and 200 mL increase in forced expiratory volume after the bronchodilator administration (Capriotti, 2020).

Treatment of disease: Asthma treatment focuses around preventing an attack or exacerbation (Capriotti, 2020). Clients are encouraged to avoid sick people and situations where the environmental conditions can be irritating to the bronchus such as smoke, chemical smells, pollutants, etc. (Capriotti, 2020). There are typically two types of inhalation medications prescribed to a person with asthma (Capriotti, 2020). One inhaler is for maintenance use on a regular basis such as a combination salmeterol and fluticasone (Capriotti, 2020). The other inhaler is typically referred to as a "rescue inhaler," and they are SABAs that relax the bronchial muscles to stop the asthma attack (Capriotti, 2020). There are additional medications that can help stop the release of leukotrienes or medications that hinder the binding of IgE antibodies to mast cells so the immune response is unable to continue at full force (Capriotti, 2020). It is important to know that the treatment regimen for asthma varies from person to person based on their need in terms of response, severity, and frequency of reaction (Capriotti, 2020). This client has a regimen of a maintenance inhaler, and a rescue inhaler prior to admission.

Lab Values/Diagnostics

Abnormal lab values:

- Glucose: 100 mg/dL (70-99mg/dL)
Client reported eating a general diet and a meal prior to ED admission, so it is only slightly high.
- MPV: 7.3 fL (8-12.6 fL)
The mean platelet volume is an expected response during asthma exacerbation (Hafez et al., 2020).
- Neutrophils: 83.8% (40.0-68.0%)
The client is under respiratory stress and potentially have an infection.
- Lymphocytes: 11.6% (19.0-49.0%)
The client may have an infection that has led to the asthma exacerbation.
- Absolute neutrophils: 7.9% (1.4-5.3%)
Elevated absolute neutrophils also points to the body fighting infection.
- WBC: 21.3 (4.0-12.0)
The client is experiencing an inflammatory response with the asthma, and likely an infection.
- Diagnostics:**
- Daily CBC with differential.
Intended to monitor for signs of infection and response.
- Daily Mg level
Magnesium has been found to have some influence in the opening of the bronchus and low Magnesium levels are often low in clients with asthma (Bokhari et al., 2022).
- Daily Metabolic panel with Calcium Total
Rule out metabolic imbalance causing the exacerbation of asthma symptoms.
- Chest X-Ray (on 1/26)
Rule out pneumonia or lung collapse as the causes of the respiratory issue.

Admission History

The client is a 44-year old Caucasian male who presented in the emergency department on the evening of 01/26/2024 complaining of dyspnea, coughing and chest tightness that began two days prior (01/24/2024) are worsening, which brought him to the hospital. The client confirms a history of asthma and reports the shortness of breath and tightness in chest were uncontrolled by regular inhaler use. The client states that exertion makes the dyspnea, coughing, and chest tightness worse, and that nothing is improving these symptoms currently, although the albuterol inhaler has helped in the past. Client has sought treatment for asthma in the past and has been hospitalized related to asthma exacerbation previously. The client reports the symptoms as severe and are interfering with activities of daily living, which is why he came in.

Medical History

Previous Medical History: Asthma, Ileus, Cerebral Seizure, sepsis, substance abuse, syncope.
Prior Hospitalizations: 1/30/2023 with pneumonia, 10/04/2022 with Asthma Exacerbation, 3/28/2020 with sepsis, 11/10/2018 with constipation.
Previous Surgical History: N/A
Social History: Client denies current alcohol use. Client reports he has recently quit smoking after a history of cigar use, and denies having ever used smokeless tobacco. Client denies current drug use but reports being a recovering addict from Methamphetamines.

Active Orders

- FULL Code Status:** The client has no alternative resuscitation orders on file and signed.
- General Diet:** There are no comorbid conditions/disease indicative of special nutrition or any upcoming labs or diagnostics that require special diet instructions.
- Aerosol Nebulizer QID and MDI as needed:** This to open the client's constricted airways from the asthma exacerbation and facilitate improving oxygenation.
- Oxygen therapy @ 2L/min and maintain 92-96%:** This is ordered to maintain an oxygen saturation level within established limits and prevent hypoxemia.
- Ambulation TID:** This is to minimize risk of developing a thrombus from immobilization and encourage mobilization of respiratory secretions that may hinder breathing efforts.
- Continuous cardiac monitoring:** Intended to monitor the cardiac status and watch for signs of cardiac arrest secondary to asthmatic exacerbation.
- Input & Output Q8 hrs:** This is used to measure fluid levels and monitor for potential impact of excessive fluid on respiratory system.
- Saline Lock IV:** This allows for immediate fluid and medication administration as needed.
- Vitals Q4 hrs:** This is to monitor the evolution of health status and drug therapy as well as the impacts on vital signs. It is also needed to evaluate effectiveness of treatment and monitor for alterations in respiratory status.
- Left Peripheral IV:** This is needed in order to administer IV fluids and to have in place in the event that immediate medication is needed.
- Number of voids & stools:** This is indicative of adequate functioning of excretory organs and appropriate nutrition.

Physical Exam/Assessment

General: The client is alert and oriented to person, place, time, and situation. Client appears well groomed and shows signs of **some distress** as evidenced by positioning.

Integument: Client's skin color is fair and appropriate for stated race/ethnicity. Skin is warm, dry, and intact on face, upper extremities, abdomen, **upper 1/3 of the lower extremities**. Client has purple ecchymosis on posterior left hand. Multiple macules distributed on upper extremities. Capillary refill less than 3 seconds bilaterally on upper and lower extremities, nails free of clubbing and cyanosis. Absent of body hair on all extremities. Skin is thin and mobile; skin turgor is normal superior to left clavicle.

HEENT: Head is symmetric, round, and free of bumps, lesions, or deformities. Hair is grey/white and distributed throughout skull and appropriate thickness for stated age. Trachea is midline with no signs of deviation and carotid pulses are 2+ bilaterally. Unable to palpate any lymph nodes on head and neck. Carotid pulse is palpable and 2+ bilaterally. Sclera is white, cornea is clear, and conjunctiva is pink bilaterally. Eyelashes and eyebrows display full thickness and are appropriately angled. EOMs intact bilaterally, and both pupils satisfy PERRLA. Pupils measured 3mm, bilaterally. Ears are symmetrical and free from excessive cerumen or lesions. Hearing is intact as evidenced by conversations during the exam. Lips are pink and well moisturized, oral mucosa is pink and moist, speech is clear and intact as evidenced by client's responses to questions.

Cardiovascular: Clear S1 and S2 auscultated. No detection of gallops, murmurs, or rubs. Heart rate and rhythm normal. Peripheral pulses on upper extremities 2+ bilaterally. **Lower extremity peripheral pulses 3+ bilaterally**. Capillary refill less than 3 seconds bilaterally in all four extremities. No jugular vein distension detected. My client's heart rate likely would have been rapid.

Respiratory: Respiratory rate of 18 with **slightly labored breathing and accessory muscle use on nasal cannula**. Clear lung sounds bilaterally on anterior and posterior sides. No wheezing, crackles, or ronchi auscultated. My client probably would have had wheezing upon auscultation of the lungs. I would probably have noted accessory muscle use, as well.

Genitourinary: Client denies any frequency, urgency, or burning with voiding.

Gastrointestinal: Bowel sounds are normoactive and present in all four quadrants. Client denies any abdominal tenderness upon soft and deep palpation in all four quadrants. No organomegaly detected. Abdomen is non-distended and free of lesions, bumps, or deformities. Client reports passing flatulence several times during the day and last bowel movement earlier today (1/29/2024).

Musculoskeletal: Bilateral grip strength is 5/5. Client moves upper extremities well and with full range of motion. Bilateral leg strength 3/5, bilateral pedal pushes 2/5 secondary to edema and weakness in bilateral lower extremities. Bilateral 3+ pitting edema and erythema of lower extremities. Brachial, radial, ulnar, and popliteal pulses palpable and 2+ bilaterally. Dorsalis pedis and anterior tibialis pulses palpable and 1+ bilaterally. My client probably wouldn't have had diminished muscle strength or range of motion, and could have increased pulse pressure due to the high blood pressure as compensation for decreased oxygenation.

Neurological: Client is alert and oriented to person, place, time, and situation. The client's cognition and speech are appropriate for stated age. Pupils satisfy PERRLA. **Bilateral lower extremity weakness**.

Most recent VS (include date/time and highlight if abnormal):

01/29/2024 @ 1709 Temp: **96.1 F temporal** **BP: 126/66** Pulse: 83 RR:19 O2: 97% on nasal cannula

My actual client likely would have had increased blood pressure and pulse as a result of the cardiovascular system working hard to compensate for decreased oxygenation. They would also likely have a respiratory rate that was high due to more frequently breathing and a decreased oxygen saturation because of the constricted pathway for oxygen travel.

Pain and pain scale used: Client reports a pain level of 3 on a numeric scale of 0-10 with zero being pain-free and 10 being the worst pain imaginable.

<p align="center">Nursing Diagnosis 1</p>	<p align="center">Nursing Diagnosis 2</p>	<p align="center">Nursing Diagnosis 3</p>
<p>Impaired gas exchange associated with asthma as evidenced by altered respiratory depth, diaphoresis, tachypnea, and irritable mood (Phelps, 2023).</p>	<p>Risk for impaired dentition associated with prescribed medications and frequent emesis (Phelps, 2023).</p>	<p>Risk for impaired resilience related to prior substance abuse and multiple unfavorable circumstances (Phelps, 2023).</p>
<p align="center">Rationale</p>	<p align="center">Rationale</p>	<p align="center">Rationale</p>
<p>Asthma can cause constricted airway clearance, impairing ability to adequately breathe. Without appropriate inhalation and exhalation, oxygen and carbon dioxide are not exchanged as necessary and there may be decreased tissue perfusion as a result which can impact extremity function.</p>	<p>Many of the prescribed medications place the client at risk for oral fungal growth, ulcers, and recent episodes of emesis place the client at risk for tooth decay and enamel erosion.</p>	<p>The client’s history of asthma, substance abuse disorder, and impaired relationships contribute as risk factors to client’s potential relapse and decreased ability to improve circumstances.</p>
<p align="center">Interventions</p>	<p align="center">Interventions</p>	<p align="center">Interventions</p>
<p>Intervention 1: Monitor the client’s vital signs every 4 hours at minimum, paying particular attention to pulse, oxygen saturation, and respiratory rate to monitor client’s hemodynamic stability and signs of hypoxemia (Phelps, 2023).</p> <p>Intervention 2: Perform percussion and help with position changes to encourage movement and excretion of drainage and airway clearance (Phelps, 2023).</p>	<p>Intervention 1: Educate and aid client in appropriate oral hygiene practices in relation to the prescribed medications through reading material and demonstrations (Phelps, 2023).</p> <p>Intervention 2: Assess client’s dentition and oral mucosa at least once during each shift to monitor for signs of fungal infection and lesions. Alert the client to any change in oral status to increase awareness of hygiene habits and need for dental follow-up (Phelps, 2023).</p>	<p>Intervention 1: Inquire about and discuss past coping mechanisms that have and have not worked for the client in similar circumstances to brainstorm actions and choices that may help the client navigate current situation and recovery (Phelps, 2023).</p> <p>Intervention 2: Give the client referrals to resources that may help in coping mechanisms and recovery from acute illness such as mental health counseling, support groups, and self-care tasks (Phelps, 2023).</p>
<p align="center">Evaluation of Interventions</p>	<p align="center">Evaluation of Interventions</p>	<p align="center">Evaluation of Interventions</p>
<p>The client’s heart rate, oxygen saturation, and respiratory rate will remain within established limits and the client will remain free of hypoxemia (Phelps, 2023).</p>	<p>The client will identify appropriate oral care needs and methods, as well as the importance of oral care after medication administration. Also, client’s dentition and oral mucosa will remain intact, and free of erosion, and fungal infection (Phelps, 2023).</p>	<p>The client will identify coping mechanisms that have previously aided in recovery and resilience as well as methods that have had adverse effects on resilience. The client will also articulate appropriate resources to help with coping and resilience efforts (Phelps, 2023).</p>

References (3) (APA):

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- Capriotti, T. (2020). *Davis Advantage for pathophysiology: Introductory concepts and clinical perspectives* (2nd ed.). F.A. Davis.
- Hafez, M. R., Eid, H.A., Elsayy, S. B., Eldin, N. E., & Madbouly, A. A. E. (2020). Assessment of bronchial asthma exacerbation: The utility of platelet indices. *Egyptian Journal of Bronchology* *13*. 623-629. https://doi.org/10.4103/ejb.ejb_69_19
- Jones & Bartlett Learning. (2021). *2023 Nurse's drug handbook* (22nd ed.). Jones & Bartlett Learning.
- Phelps, L.L. (2023). *Nursing diagnosis reference manual* (12th ed.). Wolters Kluwer.