Medications

Levalbuterol 1.25 mg/3mL (Xopenex) nebulizer. Pharmacologic class: Beta 2 agonist. Therapeutic class: Bronchodilator (Jones & Barnett, 2020). The patient is taking this medication to treat or prevent bronchospasm. Monitor O2 saturation of the patient.

Nystatin 100,000 units/g topical powder – topical antifungal. Pharmacologic class: Polyene macrolide. Therapeutic class: Antifungal (Jones & Barnett, 2020). The patient is taking this medication to treat erythema on abdomen, upper thighs, and skin creases. Assess the patient's skin.

Famotidine (Pepcid) injection 20 mg. Pharmacologic class: Histamine 2 blocker. Therapeutic class: Antiulcer agent (Jones & Barnett, 2020). The patient is taking this medication to provide short-term treatment of a duodenal ulcer. Assess the patient's vitals.

Acetaminophen (Ofirmex) IVPB 1,000 mg. Pharmacologic class: Nonsalicylate, Para aminophenol derivative. Therapeutic class: Antipyretic, nonopioid analgesic (Jones & Barnett, 2020). This patient is taking this medication to treat his elevated temperature or short-term fever. Monitor the patient's temperature.

Demographic Data

Admitting diagnosis: Respiratory distress

Age of client: 5-years-old

Sex: Male

Weight in kgs: 98.7

Allergies: No known allergies

Date of admission: 1/19/2023

Psychosocial Developmental Stage: Autonomy vs. Shame/Doubt

Cognitive Development Stage: Preoperational Stage

Admission History

A 5-year-old male presented to the ER at Sarah Bush Medical Center on 1/19/2023 and was transferred to Carle via Arrow Ambulance. He presented with respiratory distress, fever, nausea/vomiting, and O2 saturations at 70-80 on ER arrival. Temperature 103.1 F, wheezing with diminished breath sounds. The patient was given Ativan 1 mg and Benadryl 25 mg IV at Sarah Bush Medical Center before arriving at Carle. Prior to being admitted, mom stated that she tried to give him medicine and oxygen with his CPAP machine, but he would not let her, so she brought him in.

Pathophysiology

Disease process: In intermittent asthma, with acute exacerbation, the bronchioles experience spastic reactivity episodes as a result of the persistent inflammation that is asthma. When an asthmatic experiences acute bronchospasm, harmful bronchial remodeling occurs (Capriotti & Frizzell, 2020). To prevent bronchial airway changes, asthma attack prevention is essential. Allergy is a typical asthma trigger. Allergens set off the immune system, narrowing the airways, inflaming them, and increasing the size and quantity of the mucus-secreting goblet cells (Capriotti & Frizzell, 2020). In addition to bronchial edema and thickening of the bronchial basement membrane, there is bronchoconstriction (Capriotti & Frizzell, 2020). Infections with viruses that affect the respiratory system frequently cause asthma because they increase IgE synthesis in response to viral antigens. Upper respiratory viral and bacterial infections can result in bronchospasm and mucus production (Capriotti & Frizzell, 2020).

S/S of disease: Wheezing, coughing, dyspnea, and chest tightness are symptoms of asthma. The degree of bronchial hyperresponsiveness and reversibility of the bronchial blockage determine how severe the symptoms are (Capriotti & Frizzell, 2020). Airway blockage is frequently detected early on by prolonged exhalations. Auxiliary muscles, distant breath noises, and diaphoresis are used to produce severe attacks. Before taking a breath, the patient might only be able to say one or two words (Capriotti & Frizzell, 2020). Patients who experience severe airway constriction and respiratory failure have inaudible breath sounds and a constant hacking cough. If the more significant bronchial airways are affected, rhonchi may be present. Signs of chronic rhinitides, such as nasal edema, nasal polyps, rhinorrhea, and oropharyngeal erythema, may be present if allergens cause asthma (Capriotti & Frizzell, 2020). The patient's skin may exhibit eczema, a sign of allergies, especially on the neck and in the antecubital or popliteal regions (Capriotti & Frizzell, 2020).

Method of Diagnosis: A comprehensive history, physical examination, test results, and PFTs contribute to the diagnosis. To identify and assess the severity of an asthma episode, the PFT measurements of forced expiratory volume at 1 second (FEV1) and forced vital capacity (FVC) are utilized (Capriotti & Frizzell, 2020). FEV1 declines during an acute asthma episode, which lowers the ratio of FEV1/FVC (Capriotti & Frizzell, 2020). The severity of asthma should then be determined using this ratio following the administration of a bronchodilator. Asthma should be diagnosed when the FEV1 increases by at least 12% and 200 mL after taking a short-acting bronchodilator (Capriotti & Frizzell, 2020).

Treatment of disease: The purpose of treatment is to manage asthma and stop acute episodic bronchospasms. The National Asthma Education and Prevention Program created treatment guidelines that take a step-by-step approach to patient care based on the severity and frequency of symptoms and FEV1/FVC (Capriotti & Frizzell, 2020). Each stage of treatment includes medication, patient education, environmental control, and management of prior abilities (Capriotti & Frizzell,

Relevant Lab Values/Diagnostics

Diagnostics 1/19/2023

24-hour Respiratory Pathogen Panel Lab – negative/not detected (Pagana et al., 2018). There was no detection of a respiratory pathogen found in the patient's sample.

Chest X-Ray – No acute cardiopulmonary process (Pagana et al., 2018). This indicates that the heart was not enlarged even though the patient had respiratory distress.

WBC 20.7 k/moL (4.5-15.5) – It could be a possible sign of infection for the patient (Pagana et al., 2018).

RBC 4.76 x10^6/moL (3.70-5.30) (Pagana et al., 2018).

Hgb 12.9 g/dL (10.4-13.9) (Pagana et al., 2018).

Hct 37.66% (31.0-41.0) (Pagana et al., 2018).

Medical History

Previous Medical History: **Autism, developmental delay (TRMT1 gene mutation), morbid obesity, obstructive sleep apnea, chronic tonsillar hypertrophy, sensory processing difficulty, and viral URI with cough.**

Prior Hospitalizations: **Previously hospitalized for acute hypoxic respiratory failure**

Past Surgical History: N/A

Social needs: N/A

Active Orders

1/20/2023

Diet – regular: The patient can eat when he is able to.

Intake & Output – q4H: To monitor the patient's intake and output t

Brief desaturation 20 seconds or less – suction & reposition first q8H: To clear the patient's airway if needed.

Vital signs q15 until stable, then PICU basic care protocol q2H and BP q6H: To monitor the patient's vital signs throughout his stay to make sure it is stable.

Elevate head of bed: To maintain the patient's airway.

IV access – implanted port or central line/ maintain protocol: To provide medication and fluids to the patient.

Activity – increase activity as tolerated: To keep the patient as active as possible.

Suction PRN: To keep airway clear as needed.

Continuous pulse oximetry: To monitor the patient's oxygen saturation.

Assessment	
General	**Active, alert, slightly uncomfortable with the environment, and felt ease with mother at his side.**
Integument	Warm and dry, good turgor, patchy erythema (lower abdomen, groin area, and bilateral upper thighs), three healed scars on pubic area (mom stated the scars were from old pimples).
HEENT	Normocephalic, conjunctiva clear, normal mucosa, and full range of motion.
Cardiovascular	Regular rate and rhythm, no murmur, clicks, or rubs.
Respiratory	Labored breathing, tachypnea, and nasal flaring.
Genitourinary	Normal male genitalia and within defined limits.
Gastrointestinal	Unable to assess on patient due to him not wanting the stethoscope to touch him anymore.
Musculoskeletal	Strength in all extremities were present, no joint swelling, and no tenderness.
Neurological	Awake, alert, no focal deficit, and does not make eye contact.
Most recent VS (highlight if abnormal)	**Time: 0815** **Temperature: 100.3 F (37.9 C)** **Route: Axillary** **RR: 32** **HR: 106** **BP and MAP: 102/51 and 73 mmHg (mean cuff)** **Oxygen saturation: 98%** **Oxygen needs: Nasal cannula at 6 L**
Pain and Pain Scale Used	0 and rFLACC Pain Rating

Nursing Diagnosis 1 Ineffective airway clearance related to oxygen saturation as evidenced by the nasal cannula at 6 L	Nursing Diagnosis 2 Ineffective breathing pattern related to respirations as evidenced by the sound of wheezing bilaterally in the patient's lungs	Nursing Diagnosis 3 Ineffective coping related to the patient's health condition as evidenced by the mother crying while saying, "I can't do this all day"
Rationale The patient's oxygen saturation would desaturate quickly without having supplemental oxygen.	Rationale The patient's respirations were high, and his lungs' wheezing could be heard as he breathed.	Rationale The mother showed signs of ineffective coping while the patient was stressed out and reacting to taking his blood pressure.
Interventions Intervention 1: Using whatever position minimizes energy consumption and best ensures collaboration when assisting the patient with a cough and deep breathing, such as lifting the head of the bed or sitting on the side of the bed (Phelps, 2020). Intervention 2: To encourage the oxygenation of cells throughout the body, administer oxygen as directed (Phelps, 2020).	Interventions Intervention 1: Monitor the patient's ABG values and pulse oximetry readings to evaluate the oxygenation and respiratory status (Phelps, 2020). Intervention 2: Keep an eye out for respiratory distress symptoms such as nasal flaring, tachypnea, retractions, grunting, and the use of accessory muscles for breathing (Phelps, 2020).	Interventions Intervention 1: Teach strategies that the patient and mother can use to develop coping skills (Phelps, 2020). Intervention 2: Encourage patient and mother to use support systems to assist with coping (Phelps, 2020).
Evaluation of Interventions Oxygen levels in the patient stay within the usual range.	Evaluation of Interventions The patient's respiration rate continues to be within predetermined ranges.	Evaluation of Interventions Patient and mother identifies and uses at least two healthy coping behaviors like relaxation techniques.

References (3):

Capriotti, T. & Frizzell, J.P. (2020). *Pathophysiology: Introductory concepts and clinical perspectives*. (2nd ed.). F.A. Davis Company.

Jones & Bartlett Learning. (2020). *2021 Nurse's Drug Handbook* (19th ed.). Jones & Bartlett Learning.

Pagana, K. D., Pagana, T. J., & Pagana, T. N. (2018). *Mosby's Diagnostic and Laboratory Test Reference* (14th ed.). Mosby.

Phelps, L.L. (2020). *Sparks and Taylor's Nursing Diagnosis Reference Manual* (11th ed.). Wolters Kluwer.

Asthma is a chronic inflammatory disease that causes episodes of spastic reactivity in the bronchioles. With each bout of acute bronchospasm in asthma, deleterious bronchial remodeling occurs (Capriotti & Frizzell, 2020). Prevention of asthma attacks is critical to avert bronchial airway alterations. Allergy Is a common stimulus of asthma. Allergens trigger the immune system, causing bronchial constriction, inflammation, and an increase in the size and number of goblet cells that secrete mucus (Capriotti & Frizzell, 2020). There is bronchoconstriction, bronchial edema, viscous mucus, and thickening of the bronchial basement membrane Capriotti & Frizzell, 2020). Asthma is also commonly triggered by viral respiratory infections that stimulate the production of IgE directed toward the viral antigens. Viral and bacterial upper respiratory infections commonly cause bronchospasm and copious mucus production Capriotti & Frizzell, 2020).