

Medications

- **Aformoterol Tartrate (Brovana) Nebulizer Solution 15 mcg BID**
 - **Indication for Use:** Maintenance treatment of bronchoconstriction in patients with chronic obstructive pulmonary disease (COPD), including chronic bronchitis and emphysema (Nurses Drug Handbook, 2023)
 - **Pharmacological-Class:** Long-acting beta agonists (Nurses Drug Handbook, 2023)
 - **Therapeutic-Class:** Bronchodilator (Nurses Drug Handbook, 2023)
 - **Nursing Assessments Prior to Administration:** Assess heart rate (Nurses Drug Handbook, 2023)
- **Azithromycin (Zithromax) Tablet 500 mg Oral q24H**
 - **Indication for Use:** To treat mild community-acquired pneumonia, pharyngitis, tonsillitis, and uncomplicated skin and soft-tissue infections caused by susceptible bacteria (Nurses Drug Handbook, 2023)
 - **Pharmacological-Class:** Macrolides (Nurses Drug Handbook, 2023)
 - **Therapeutic-Class:** Antibiotic (Nurses Drug Handbook, 2023)
 - **Nursing Assessments Prior to Administration:** Monitor bowel elimination (Nurses Drug Handbook, 2023)
- **Budesonide (Pulmicort) Nebulizer Suspension 500 mcg BID**
 - **Indication for Use:** To manage symptoms of seasonal or perennial allergic rhinitis (Nurses Drug Handbook, 2023)
 - **Pharmacological-Class:** Corticosteroid (Nurses Drug Handbook, 2023)
 - **Therapeutic-Class:** Antiasthmatic, anti-inflammatory (Nurses Drug Handbook, 2023)
 - **Nursing Assessments Prior to Administration:** Monitor patient for evidence of hypersensitivity (Nurses Drug Handbook, 2023)
- **Ceftriaxone (Rocephin) Injection 2 g q24H Intravenous**
 - **Indication for Use:** To treat infections such as bacterial meningitis (Nurses Drug Handbook, 2023)
 - **Pharmacological-Class:** Third-generation cephalosporin (Nurses Drug Handbook, 2023)
 - **Therapeutic-Class:** Antibiotic (Nurses Drug Handbook, 2023)
 - **Nursing Assessments Prior to Administration:** Obtain culture and sensitivity results (Nurses Drug Handbook, 2023)
- **Enoxaparin (Lovenox) Injection 30 mg Subcutaneous q24H**
 - **Indication for Use:** To prevent deep vein thrombosis (Nurses Drug Handbook, 2023)
 - **Pharmacological-Class:** Low-molecular-weight heparin (Nurses Drug Handbook, 2023)
 - **Therapeutic-Class:** Anticoagulant (Nurses Drug Handbook, 2023)
 - **Nursing Assessments Prior to Administration:** Watch closely for bleeding (Nurses Drug Handbook, 2023)
- **Guaifenesin (Mucinex) SR Tablet 600 mg BID Oral**
 - **Indication for Use:** Providing temporary symptomatic relief from congested chests and coughs (Nurses Drug Handbook, 2023)
 - **Pharmacological-Class:** Mucolytic (Nurses Drug Handbook, 2023)
 - **Therapeutic-Class:** Expectorant (Nurses Drug Handbook, 2023)
 - **Nursing Assessments Prior to Administration:** Check if patient is diabetic (Nurses Drug Handbook, 2023)
- **Ipratropium Albuterol (DuoNeb) 0.5-2.5 (2) mg/2ml Nebulizer Solution 3 ml q6H**
 - **Indication for Use:** Management of acute exacerbations of asthma flares requiring treatment (Nurses Drug Handbook, 2023)
 - **Pharmacological-Class:** Anticholinergic antispasmodic (Nurses Drug Handbook, 2023)
 - **Therapeutic-Class:** Bronchodilator (Nurses Drug Handbook, 2023)
 - **Nursing Assessments Prior to Administration:**
- **Methylprednisolone Na Suc (IPF) (Solu-MEDROL) Injection 40 mg q12H Intravenous**
 - **Indication for Use:** To treat immune and inflammatory disorders (Nurses Drug Handbook, 2023)
 - **Pharmacological-Class:** Glucocorticoid (Nurses Drug Handbook, 2023)
 - **Therapeutic-Class:** Corticosteroid (Nurses Drug Handbook, 2023)
 - **Nursing Assessments Prior to Administration:** Assess for possible depression or psychotic episodes (Nurses Drug Handbook, 2023)
- **Pantoprazole (Protonix) Tablet 40 mg Oral Daily**
 - **Indication for Use:** To treat erosive esophagitis associated with reflux disease short term (Nurses Drug Handbook, 2023)
 - **Pharmacological-Class:** Proton pump inhibitor (Nurses Drug Handbook, 2023)
 - **Therapeutic-Class:** Antisecretory (Nurses Drug Handbook, 2023)
 - **Nursing Assessments Prior to Administration:** Monitor patients urine output (Nurses Drug Handbook, 2023)

Demographic Data

Date of Admission: 8/26/2023
Admission Diagnosis/Chief Complaint: Acute respiratory failure with hypoxia and hypercarbia
Age: 65 y/o
Gender: Female
Race/Ethnicity: Caucasian
Allergies: Povidone iodine
Code Status: Full
Height in cm: 152.4 cm
Weight in kg: 31.2 kg
Psychosocial Developmental Stage: Generativity vs. stagnation
Cognitive Developmental Stage: Formal Operational
Braden Score: 17
Morse Fall Score: 54
Infection Control Precautions: N/A

Pathophysiology

Disease process: A critical condition that makes it challenging to breathe on your own is respiratory failure. When the lungs can't get enough oxygen into the blood, respiratory failure sets in. The accumulation of carbon dioxide can harm the body's cells and organs and hinder or delay the transport of oxygen. Acute respiratory failure strikes suddenly and with little notice. It is frequently brought on by a breathing-related illness or injury, such as pneumonia, an opioid overdose, a stroke, or a lung or spinal cord damage. A delayed progression of respiratory failure is possible. Chronic respiratory failure is the term used when this occurs. Shortness of breath or the sensation that you aren't getting enough oxygen, excessive exhaustion, the inability to exercise as you once did, and sleepless are among symptoms. Based on your blood oxygen and carbon dioxide levels, a physical examination to gauge how quickly and shallowly you breathe and how hard you are working to breathe, the results of lung function tests, and other factors, a doctor may determine that you have respiratory failure. If a major lung condition, such as respiratory failure, is identified, you may require additional oxygen delivered through tubes placed in your nose or assistance from a ventilator, a breathing apparatus (Healthline, 2023).

S/S of disease: The signs and symptoms of respiratory failure vary depending on the underlying cause, blood oxygen and carbon dioxide levels, and whether the condition develops gradually over time or suddenly. A crisis that poses a risk to life can arise from acute respiratory failure. Low blood oxygen levels can make it difficult to perform daily tasks like getting dressed, taking a shower, and climbing stairs due to extreme exhaustion, as well as cause drowsiness, air hunger, shortness of breath, and bluish discoloration of your fingers, toes, and lips.

Vision blurring, mental confusion, headaches, and fast breathing are all symptoms of high blood carbon dioxide levels. Both high carbon dioxide levels and low oxygen levels might cause symptoms.

If the brain does not receive enough oxygen or if carbon dioxide levels are excessively high, some people with respiratory failure become exceedingly tired or lose consciousness. It's crucial to get treatment right away since untreated respiratory failure can harm the kidneys and brain in addition to the lungs (Cleveland Clinic, 2023).

Method of Diagnosis: Measurements of oxygen, carbon dioxide, pH, and bicarbonate are made during arterial blood gas tests. From the patient's arteries, a sample of the blood will be obtained. These tests assist in identifying the type of respiratory failure you may have as well as its presence. Finding the reason for your respiratory failure may be assisted by blood tests. A physical examination to determine how quickly and shallowly the patient breathes and how hard the patient is breathing, as well as the results of lung function tests, may also be used to diagnose respiratory failure in a patient. Key diagnostic procedures also include pulse oximetry, chest x-rays, blood gas analysis, and end-tidal carbon dioxide monitoring. Making sure the upper airway is clear of impediments and patient is the first step in treatment (National Institute of Health, 2022). The patient had an abnormal venous CO2 lab result which showed that the patient was insufficient when trying to expel CO2.

Treatment of disease: Assessing the airway, breathing, and circulation should be the first step in treating individuals with acute respiratory failure. In order to sustain sufficient ventilation, oxygenation, and correction of blood gas irregularities, supportive methods depend on patient airways (National Institute of Health, 2023). The patient might get oxygen therapy if they have respiratory failure. The patient's lungs can receive oxygen in a variety of ways. Some of the ways are a noninvasive positive pressure ventilation, bag mask ventilation, a mechanical ventilator, or a tracheostomy.

To keep the patient's airways open, noninvasive positive pressure ventilation (NPPV) uses little air pressure. The patient can wear a mask, plastic tubes on the nose, or any item that covers the patient's mouth and nose. The mask is connected via a tube to a device that blows air into the tube. One kind of noninvasive positive pressure ventilation is continuous positive airway pressure.

A bag mask ventilation requires the patient to wear a mask and a bag mask ventilation employs a bag to push extra air into the lungs. This is frequently carried out while the patient waits for a difficult surgery to address the underlying cause of their respiratory failure.

A device that helps in breathing is a mechanical ventilator. Air, or air with more oxygen, is blown into the patient's airways and ultimately into their lungs. If the patient's blood oxygen level does not rise with NPPV or if the patient continues to have breathing difficulties, the healthcare professional may decide to treat the patient with a ventilator. Utilizing a ventilator, particularly for an extended period of time, can harm the lungs and always result in infections like pneumonia.

A tracheostomy is a hole created during surgery that enters the windpipe through the front of the patient's neck. When the patient's airways are clogged, a breathing tube is inserted into the hole to provide oxygen (National Institute of Health, 2022). This patient was ordered to have oxygen therapy, was put on oxygen therapy continuous ventilator due to low oxygen level, and was ordered to have a pulse oximetry done to monitor arterial blood tension.

Lab Values/Diagnostics

Lab Values	Normal range	Lab value	Reason for abnormality
Chloride 8/28/23:	96-107 mmol/L	91 mmol/L	Reason for abnormality: Due to possibility of low fluid levels due to vomiting
CO2, Venous 8/28/23:	22-35 mmol/L	47 mmol/L	Reason for abnormality: Due to the possibility of alveolar ventilation insufficiency when trying to exhale the carbon dioxide being produced
Creatinine, blood 8/28/23:	0.60-1.00 mg/dL	0.52 mg/dL	Reason for abnormality: Due to possibility of muscle atrophy or weakness
Glucose 8/28/23:	75-99 mg/dL	138 mg/dL	Reason for abnormality: Due to the possibility of dehydration
MCV 8/28/23:	82.0-100.0 fL	91.7 fL	Reason for abnormality: Due to the possibility of anemia
Neutrophils 8/28/23:	47.0-73.0%	90.8%	Reason for abnormality: Due to the possibility of infection
Lymphocytes 8/28/23:	28.0-42.0%	8.8%	Reason for abnormality: Due to the possibility of infection
Monocytes 8/28/23:	4.0-12.0%	2.5%	Reason for abnormality: Due to the possibility of infection
Absolute lymphocytes 8/28/23:	1.30-2.00 (x10 ³)/mL	0.40 (x10 ³)/mL	Reason for abnormality: Due to the possibility of pneumonia
Absolute monocytes 8/28/23:	0.30-1.00 (x10 ³)/mL	0.10 (x10 ³)/mL	Reason for abnormality: Due to the possibility of a pneumonia

Admission History

The patient presents to the ED due to shortness of breath on 8/26/23. The patient has a history of Chronic Obstructive Pulmonary Disease and anxiety. The patient states the onset of the severe shortness of breath "started on the evening of 8/26/23." The patient states the location of the pain was "in the chest." The duration lasted from that moment until the patient was admitted to the emergency department via ambulance. The characteristics that the patient felt was "being unable to get air" and "tightness in the chest." Patient states that "the anxiety" was an aggravating factor for the patient's inability to get air. Patient states that "there were no relieving factors at home prior to arriving at the emergency department. Patient states that "there were no treatments to try to reduce the symptoms at home. Patient states that the severity of the pain was "a 10" on the 0-10 pain scale.

Medical History

Previous Medical History: COPD (HCC)
Prior Hospitalizations: 5/28/23- Acute on chronic respiratory failure with hypoxia, 4/21/23- COPD with exacerbation, 4/19/23- Positive D dimer

Previous Surgical History: N/A

Social History: Tobacco Use: (everyday, cigarettes), never used smokeless tobacco
Alcohol Use: Not known
Drug Use: Not Known

Active Orders

- **Diet/Nutrition**
 - General diet due to patient not having special needs related to illness.
 - Consult for diet nutrition evaluation due to needing an assessment of patient's nutrition status.
- **Labs**
 - CMP (Comprehensive Metabolic Panel) daily AM draw due to needing to check the patient's blood sugar.
 - Complete blood count with differential daily AM draw due to patient having unusual bruising on body.
 - Culture, Respiratory, and Lower one time due to patient having excess sputum.
 - Magnesium (MG) daily AM draw due to levels of calcium.
- **Therapy**
 - OT evaluation due to generalized weakness.
 - PT evaluation due to generalized weakness.
- **Respiratory**
 - Communication to respiratory therapy due to patient's hypoxia.
 - Flutter Valve- initial one time due to patient's increased mucous production.
 - Oxygen therapy continuous ventilator due to patient's low oxygen level.
 - Aerosol nebulizer q6H due to patient's struggle with hypoxia.
- **Other Orders**
 - Cardiac monitoring until specified due to the chance of the patient having irregular heartbeats.
 - Insert/maintain peripheral IV for possible administration fluid or medications.
 - Notify physician for:
 - symptomatic bradycardia (until discontinued) due to cardiac issues.
 - ventricular arrhythmias (until discontinued) what do you do the chance of abnormal heartbeats.
 - Place sequential compression device (HUC orders equipment) (until discontinued) to help maintain blood flow.
 - Pulse oximetry (STAT, one time) for the measurement of arterial oxygen tension.
 - Telemetry monitoring (continuous 48 hours) due to the patient having 1

Physical Exam/Assessment

General: Patient is alert and oriented to person, place, situation, and time. Patient appears appropriate. Patient age is not in proportion with their appearance. Patient is without visible signs of acute distress.

Integument: Skin color is fair and usual for that of Caucasian decent. Skin is warm and dry to the touch. **Skin turgor is loose and greater than 2 seconds.** Skin is without notable lesions, lumps, **but has bruising.** Patient's body hair has normal distribution, quality, quantity, and texture. Nailbeds of bilateral upper and lower extremities are without visible clubbing and cyanosis. **Capillary refill for bilateral upper and lower extremities is greater than three seconds.** No other visible wounds found but **some scaring on arms and legs.**

HEENT: Head was round and symmetrical without visible lesions, lumps, bruises, or abnormalities. Hair appeared to be white and thin. **Neck** appeared symmetrical and without visible lesions, lumps, bruises, or deformities. Bilateral carotid arteries palpable with pulses 2+. Trachea is midline without deviation, thyroid is not palpable, no noted nodules. **Ears** were symmetric with bilateral auricles being without visible lesions, lumps, bruises, or abnormalities. **Eyes** were round and symmetrical without visible lesions, lumps, bruises, abnormalities, or discharge. Bilateral conjunctiva was pink and moist. PERRLA and EOMs intact bilaterally. Patient wears reading glasses but they were left at home. **Nose** midline and symmetrical to face and without visible lesions, lumps, abnormalities, or discharge. **Mouth/Throat** without visible lesions, lumps, abnormalities, or exudate. Posterior pharynx and tonsils are moist and pink **with exudate noted.** Uvula is midline; soft palate rises and falls symmetrically. Hard palate intact. **Dentition is poor due tooth loss. Lips seem dry.**

Cardiovascular: Clear S1 and S2 without murmurs gallops or rubs. PMI palpable at 5th intercostal space at MCL. Normal rate and rhythm. No edema noted.

Respiratory: Normal rate and pattern of respirations, respirations symmetrical and non-labored, **lung sounds wet throughout anterior/posterior bilaterally, wheezes present,** no crackles, no rhonchi noted. **Breath sounds diminished. Patient on 2L nasal cannula.**

Genitourinary: Urine is clear and yellow. Patient is able to urinate without pain or burning sensations. Patient is currently not on dialysis treatment and had a urine output occurrence once today. Patient does not have a urinary catheter. **Inspection of the genitals was not assessed.**

Gastrointestinal: Abdomen is soft, nontender, no organomegaly or masses notes upon palpation of all four quadrants. Bowel sounds are normoactive in all four quadrants. No CVA tenderness noted bilaterally.

Musculoskeletal: All extremities have full range of motion (ROM). Hand grips and pedal pushes and pulls demonstrate normal and equal strength. **Gait is weak.**

Neurological: Patient alert and oriented to person, place, and time. PERRLA.

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

Time: 1052 Temp: 98.5 F O2: 98 **P:112 bpm** RR:17 **BP:143/88 mmHg**

Pain and pain scale used:

0-10 scale **6/10 back pain**

<p align="center">Nursing Diagnosis 1</p> <p>Risk of impaired gas exchange as evidenced by CO2 lab results of 47 mmol/L (Phelps, 2020).</p>	<p align="center">Nursing Diagnosis 2</p> <p>Risk for electrolyte imbalance evidenced by Chloride lab results of 90 mmol/L (Phelps, 2020).</p>	<p align="center">Nursing Diagnosis 3</p> <p>Risk of suffocation as evidenced by excess sputum from lungs (Phelps, 2020).</p>
<p align="center">Rationale</p> <p>Poor pulmonary status may result in hypoxemia (Phelps, 2020)</p>	<p align="center">Rationale</p> <p>Electrolyte levels are susceptible to change when there is an elevated performance of vomiting. (Phelps, 2020).</p>	<p align="center">Rationale</p> <p>Risk of suffocation is suspected due to the change of fluid levels in the lungs (Phelps, 2020).</p>
<p align="center">Interventions</p> <p>Intervention 1: Every four hours, or more frequently if the patient's state is unstable, determine and record the patient's pulmonary status (Phelps, 2020).</p> <p>Intervention 2: Cough, percussion, postural draining, and suctioning are all examples of bronchial hygiene that should be carried out as directed (Phelps, 2020).</p>	<p align="center">Interventions</p> <p>Intervention 1: As directed, collect and analyze serum electrolyte findings (Phelps, 2020).</p> <p>Intervention 2: Keep an eye out for any physical indications of electrolyte imbalance in the patient (Phelps, 2020).</p>	<p align="center">Interventions</p> <p>Intervention 1: Position patient on the side or adjust position of head of bed (Phelps, 2020).</p> <p>Intervention 2: Monitor patient's vital signs and report changes. Tachycardia and a slight rise in blood pressure may indicate hypoxia (Phelps, 2020).</p>
<p align="center">Evaluation of Interventions</p> <ul style="list-style-type: none"> The patient carries out ADLs without showing any indications of dyspnea or other abnormal ABG values (Phelps, 2020). The patient maintains good bronchial hygiene (Phelps, 2020). 	<p align="center">Evaluation of Interventions</p> <ul style="list-style-type: none"> Patient's electrolyte levels remain within normal limits (Phelps, 2020). Patient verbalizes signs and symptoms that require immediate interventions by health care provider (Phelps, 2020). 	<p align="center">Evaluation of Interventions</p> <ul style="list-style-type: none"> Patient's airway remains free from obstruction (Phelps, 2020). Patient's vital signs remain within normal parameters (Phelps, 2020).

References (3) (APA):

Healthline. *Acute Respiratory Failure: Types, Symptoms, Treatment*. (2023, January 4). Healthline. <https://www.healthline.com/health/acute-respiratory-failure>

Cleveland Clinic. *Respiratory Failure*. (2023, May 15). Cleveland Clinic. <https://my.clevelandclinic.org/health/diseases/24835-respiratory-failure>

National Institute of Health. *Respiratory Failure*. (2023, June 11). <https://www.ncbi.nlm.nih.gov/books/NBK526127/#:~:text=However%2C%20the%20initial%20steps%20in,correction%20of%20blood%20gas%20abnormalities>.

National Institute of Health. *Respiratory Failure*. (2022, March 24). <https://www.nhlbi.nih.gov/health/respiratory-failure/diagnosis#:~:text=Arterial%20blood%20gas%20tests%20measure,cause%20of%20your%20respiratory%20failure>.

Phelps, L. (2020). Sparks & Taylor's Nursing Diagnosis Reference Manual (11th ed.). LWW