Medications

HumuLIN R U-500
- Pharmacological class: Human insulin
- Therapeutic class: Antidiabetic

The client is taking this medication because he has type 2 diabetes mellitus. A key nursing assessment prior to administration of this medication is obtaining the patient's current blood glucose levels and verifying that the solution is clear and colorless (Jones & Bartlett Learning, 2022).

Furosemide
- Pharmacological class: Loop diuretic
- Therapeutic class: Antihypertensive; diuretic

The client is taking this medication because he has fluid buildup from his CHF diagnosis. The furosemide will help to expel the excess fluid in his body through urination. The nurse should assess the patient's I&O's, daily weight, amount and location of edema, skin turgor, and lung sounds before administering furosemide (Jones & Bartlett Learning, 2022).

Amlodipine
- Pharmacological class: Calcium channel blocker
- Therapeutic class: Antianginal; antihypertensive

The client is taking this medication to help control his hypertension. The nurse should assess the patient's heart rate and blood pressure before administering this medication (Jones & Bartlett Learning, 2022).

Atorvastatin
- Pharmacological class: HMG-CoA reductase inhibitor
- Therapeutic class: Antihyperlipidemic

The client is taking this medication to help control his lipid levels due to his hyperlipidemia diagnosis. The nurse should obtain baseline levels of the patient's cholesterol, triglycerides, and liver function tests and assess for signs of muscle weakness or pain (Jones & Bartlett Learning, 2022).

Azithromycin
- Pharmacological class: Macrolide
- Therapeutic class: Antibiotic

The patient is taking this medication because evidence of pneumonia was found in his lungs on the chest x-ray. The nurse should check for any allergies, any presence of a prolonged QT interval, and any history of hepatic dysfunction (Jones & Bartlett Learning, 2022).

Lab Values/Diagnostics

Hemoglobin: 7.1 g/dL (12.0 – 18.0 g/dL)
- This client was diagnosed with acute on chronic anemia in January of 2024. Decreased hemoglobin levels can be due to anemia (Pagana et al., 2020).

Calcium: 8.0 mg/dL (8.9 – 10.6 mg/dL)
- This patient was taking furosemide to help expel excess fluids from his body. Furosemide is a loop diuretic and loop diuretics have been known to cause decreased calcium levels (Pagana et al., 2020). The patient was also in advanced chronic kidney disease (CKD) according to the nephrologist. Renal failure has also been known to cause decreased calcium levels (Pagana et al., 2020).

BUN: 100 mg/dL (8 – 26 mg/dL)
- The patient has been diagnosed with CHF. Increased levels of BUN have been known to be caused by CHF (Pagana et al., 2020).

Creatinine: 5.33 mg/dL (0.70 – 1.30 mg/dL)
- The patient has been diagnosed with CHF. Increased levels of creatinine have been known to be caused by reduced renal blood flow due to CHF (Pagana et al., 2020).

CO_2: 20.0 mmol/L (22.0 – 29.0 mmol/L)
- The patient was deemed to be in advanced chronic kidney disease (CKD) by the nephrologist. Decreased levels of CO_2 can be caused by renal failure (Pagana et al., 2020).

Chest X/Ray (3/21/24 & 3/24/24): same findings
- The chest x-ray was performed because the patient was experiencing shortness of breath on the 21st and then acute onset of chest pain on the 24th of March. A patchy infiltrate was seen in the left lower lobe which indicates possible pneumonia. The cardiomediastinal silhouette was slightly enlarged but no pleural effusion was indicated. Chest x-rays are helpful in identifying suspected pneumonia (Pagana et al., 2020).

Chest CT w/o Contrast (3/21/24)
- The patient had been diagnosed previously with an ascending aortic aneurysm on 8/31/20). A chest CT scan was performed to see if there was any change because chest CT scans are used to visualize aortic aneurysms (Pagana et al., 2020). The ascending aortic aneurysm measured 4.6 cm.

Demographic Data

Date of Admission: March 22, 2024
Admission Diagnosis: Acute on chronic heart failure with preserved ejection fraction
Chief Complaint: Shortness of breath
Age: 66 years old
Gender: Male
Race/Ethnicity: White/Caucasian
Allergies: Insulin Lispro
Code Status: Full Code
Height in cm: 185.4 cm
Weight in kg: 143.3 kg
Psychosocial Developmental Stage: Integrity vs. Despair (Older adulthood stage)
Cognitive Developmental Stage: Formal operational stage
Braden Score: 21 (No risk)
Morse Fall Score: 60 (High risk)
Infection Control Precautions: Standard precautions

Admission History

On March 30, 2024, the patient began having signs and symptoms. Location of the patient's signs and symptoms include his chest and lower extremities. The signs and symptoms lasted for two days and that is when his wife brought him into the ED, on March 22, 2024. Characteristics of his symptoms include shortness of breath upon exertion, orthopnea, lower extremity edema, cough, sputum, sore throat, lungs whistling while lying flat, and chronic diarrhea due to cholecystectomy. The patient stated that exerting himself upon movement and lying flat aggravated his symptoms. The patient admitted that resting while sitting up relieved some of his symptoms "a little". The patient did not try any medications at home to relieve his symptoms. While in the ED the patient was given the following treatment: vitals taken, chest x-ray, oxygen via nasal canula at 6 L, Troponin test, and a COVID test. The patient stated that he was not experiencing any pain while in the ED. He rated his pain a "0 out of 10" on the numerical scale.

Medical History

Previous Medical History: Advanced CKD (3/22/24); acute on chronic anemia (1/16/24); COVID (12/25/21); diabetes mellitus type 2; Diabetes retinopathy; hypertension; hyperlipidemia; peripheral neuropathy; vitreous floaters (right); ascending aortic aneurysm (8/31/20); atherosclerosis of native art artery of both lower extremities with intermittent claudication (8/31/20); and CAD.

Prior Hospitalizations: Blood in stool (1/24/24); other previous hospitalizations took place at OSF (dates & reasons unknown)

Previous Surgical History: EGD/Colonoscopy (1/26/24); gallbladder surgery (date unknown); intravitreal injection (date unknown); PRP laser-bilateral (1/29/21); CABG (2/28/17); and cardiac catheterization ((2/23/17).

Social History: The patient stated he has never smoked or used any kind of tobacco products in his life, used any drugs, and he currently does not any consume alcohol.

Pathophysiology

Disease process: Congestive heart failure (CHF), also known as heart failure takes place when the heart is unable to sufficiently pump enough blood to satisfy the body's needs. An injury to the heart causes the insufficient pumping of blood to occur, an injury such as cardiac tissue infiltration, ischemia, myocarditis, valvular heart disease, acute myocardial injury, etc. (Malik et al., 2023). "A decrease in cardiac output and increased sympathetic drive stimulate the RAAS, leading to increased salt and water retention, along with increased vasoconstriction" (Malik et al., 2023). Once the RAAS system has been stimulated that causes the release of antiotensin II which has been known to cause interstitial fibroses and myocardial cellular hypertrophy, which contributes to alterations of the heart (Malik et al., 2023). This leads to an accumulation of fluid that ends up relocating to the lungs or any of the extremities. The patient has experienced dependent edema in his lower extremities bilaterally. The patient has also been diagnosed with hypertension and coronary artery disease which are two diagnoses that can lead to CHF.

S/S of disease: CHF can cause varying types of manifestations, those include crackles in the lungs, pulmonary edema, JVD while at rest, shortness of breath upon exertion, orthopnea, paroxysmal nocturnal dyspnea, cyanosis, weak pulses, enlargement of the heart, presence of an S_3 and/or S_4 sound, tachycardia, ascites, dependent edema, and weight gain (Capriotti, 2020). The patient was experiencing shortness of breath upon exertion, orthopnea, dependent edema, weight gain, and upon arriving to the ED the provider did auscultate the lungs and heard crackles.

Method of Diagnosis: A patient who has been diagnosed with CHF will have had to meet the Framingham Criteria for Diagnosis of Congestive Heart Failure (Capriotti, 2020). Within these criteria there are major and minor categories of criteria. The patient will have to exhibit one major and two minor criteria to be diagnosed with CHF. Major criteria include: JVD, enlargement of the heart, pulmonary crackles, presence of an S_3 heart sound, an elevated CVP, and a positive hepatojugular reflux. Minor criteria include edema in bilateral extremities, coughing during the night, shortness of breath upon exertion, enlargement of the liver, pleural effusion, increased heart rate, and reduced pulmonary vital capacity (Capriotti, 2020). Other diagnostic and laboratory tests performed to diagnose CHF can include a BNP, electrolytes, chest X-ray, an ECG, echocardiogram, cardiac catheterization, and angiography (Capriotti, 2020). The patient had his electrolytes and a chest X-ray performed during his current stay at the hospital.

Treatment of disease: Treatment for CHF varies from lifestyle modifications to pharmacological therapies to inserting devices or cardiac transplantation. Typical lifestyle modifications that can help treat CHF includes eating a healthy diet that's low in fat, stop smoking, exercise more, lose weight, and limiting the consumption of fluid, cholesterol, salt, and alcohol. Pharmacological therapies include ACE inhibitors, diuretics, aldosterone antagonists, angiotensin II receptor blockers, beta-1-adrenergic blockers, synthetic natriuretic peptides, inotropics, ivabradine, nitrates, neprilysin, and arterial vasodilators (Capriotti, 2020). There are three different devices that could be applicable to patients with CHF and those include cardiac resynchronization therapy (CRT), left ventricular assist device (LVAD), and an intra-aortic balloon pump (Capriotti, 2020). Approximately 5% of patients with end-stage heart failure have a 1 – 5-year life expectancy. Patients in these categories may be eligible for a heart transplant. Patients who have less comorbidities such as obesity, cancer, diabetes, etc. will be a better candidate than those with several comorbidities (Capriotti, 2020). The patient was being treated by pharmacological therapy while at the hospital. The patient did agree to some possible lifestyle changes he could make after being discharged from the hospital.

Active Orders

- Telemetry
  - The patient was placed on telemetry due to his cardiac issues including CHF and an ascending aortic aneurysm.
- Vitals Q4h
  - Taking vitals Q4h will help monitor the patient's overall status and see when they begin to decline. For example, monitoring the oxygen saturation and respirations might indicate additional fluid buildup in the lungs which could hinder the patient's breathing.
- I & O's Q4h
  - Monitoring I & O's Q4h will help determine how much fluid the patient is retaining due to his CHF diagnosis.
- Daily weight
  - Monitoring the patient's daily weight will help determine if they are gaining weight due to fluid retention because of the patient's CHF diagnosis.
- Activity
  - This patient was placed on activity tolerance to measure the patient's ability to move and do ADL's.
- Diet Order (regular low sodium diet)
  - The client was placed on a regular low sodium diet due to his diagnoses related to his heart, hypertension, hyperlipidemia, atherosclerosis, CAD, and CHF.
- Fluid restriction (1,800 mL)
  - The client was placed on fluid restrictions to manage the patient's I & O's and to prevent too much fluid from building up in the body.
- Cardiology consult
  - The client had a cardiology consult due to his diagnosis of CHF and previously found ascending aortic aneurysm.
- Nephrology consult
  - The patient had a nephrology consult due to his BUN and creatinine levels being extremely elevated. The patient was found to be in advanced CKD.

Physical Exam/Assessment

General:

The patient is alert and oriented to person, place, time, and situation. The patient is well groomed for hospital setting and is not experiencing acute distress.

Integument:

The patient's skin color is pale ivory. The skin is warm and dry upon palpation. No lesions, rashes, or bruising noted. Normal quantity, texture, and distribution of hair. Nails without clubbing or cyanosis. Skin turgor returned to normal immediately. Capillary refill is less than 3 seconds in fingers and toes bilaterally.

HEENT:

Head and Neck: Head and neck are symmetrical, trachea is midline with no deviation noted, thyroid is not palpable, and no nodules observed. Carotid pulses are palpable and 2+ bilaterally. No presence of lymphadenopathy in the head or neck.

Eyes: Bilateral sclera is white, cornea is clear, and conjunctiva is pink. No drainage from the eyes present bilaterally. Eye lids are pink and moist bilaterally, no discharge or lesions observed. PERRLA and EOMs are intact bilaterally. Pupil size is 4 mm bilaterally. Unable to assess red light reflex.

Ears: Auricles have no visible or palpable lumps, lesions, or deformities bilaterally. Unable to assess ear canals bilaterally.

Nose: Septum is midline, turbinates appear pink in color and moist bilaterally with no visible polyps or bleeding. Frontal sinuses are nontender upon palpation bilaterally.

Throat and Mouth: Uvula is midline, soft palate rises and falls symmetrically. Hard palate is intact. Oral dentition is good, oral mucosa is pink in color and moist with no lesions observed. Posterior pharynx and tonsils are moist and pink with no exudate present. Tonsil size 2+.

Cardiovascular:

The patient has clear S1 and S2, no murmurs, gallops, or rubs noted. PMI is palpable at the fifth intercostal space at the MCL. Normal rate and rhythm was observed.

Respiratory:

Normal pattern and rate of respiration, respirations are non-labored. Bases of lungs have decreased breath sounds bilaterally. Upper lobes bilaterally and right middle lobe sounds clear throughout anteriorly and posteriorly. No presence of wheezes, crackles, or rhonchi.

Genitourinary:

The patient's urine is light yellow and clear in appearance. Frequency of urination increased, no urgency noted, and no complaints of pain.

Gastrointestinal:

Abdomen is soft and non-tender, no organomegaly or masses observed upon palpation in all 4 quadrants. Bowel sounds are normoactive in all four quadrants with 5 – 34 clicks/gurgles per minute. No CVA tenderness noted upon palpation bilaterally.

Musculoskeletal:

The patient has full and active range of motion with slight weakness in all extremities. Hand grips and pedal pushes and pulls exhibit equal and slightly weakened strength, strength is recorded 4+. Unable to assess patient's gait.

Neurological:

The patient is alert and oriented to person, place time, and situation. No impairment of cognition noted. Speech is clear and coherent. PERRLA intact bilaterally. Cranial nerves 1 – 12 are intact. Unable to assess Rhombergs. Deep tendon reflexes in lower extremities 1+ bilaterally.

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

3/25/24 at 11:43 a.m. Blood Pressure: 138/65 mm Hg Heart Rate: 70 bpm Temperature: 97.9°F (36.6°C) Oxygen Saturation: 96% (room air) Respiration Rate: 18 bpm

Pain and pain scale used:

Pain: 0/10 (numerical scale)

Nursing Diagnosis 1	Nursing Diagnosis 2	Nursing Diagnosis 3
Risk for impaired gas exchange related to acute on chronic anemia diagnosis as evidenced by the patient's decreased hemoglobin level.	Risk for fluid volume overload related to CHF diagnosis as evidenced by increased levels of creatinine and BUN.	Risk for falls related to taking 2 or more high-risk fall drugs (amlodipine & carvedilol) as evidenced by his history of previous falls.
Rationale The patient has a hemoglobin level of 7.1 g/dL and has been diagnosed with anemia. The patient is at risk for impaired gas exchange due to the decreased oxygen-carrying capacity of his red blood cells based on the hemoglobin level.	**Rationale** The patient had a BUN level of 100 mg/dL and a creatinine level of 5.33 mg/dL, which is excessively high. The patient was also diagnosed with advanced CKD by the nephrologist. Both of these issues will hinder the patient's ability to expel fluids from his body via urination properly.	**Rationale** The patient has a history of at least one fall in the last six months and is currently taking medication that places him at a high risk for falls.
Interventions **Intervention 1:** "Assess and record pulmonary status every 4 hours or more frequently if patient's condition is unstable" (Phelps, 2022). **Intervention 2:** "Monitor ABG levels and notify the physician immediately if PaO_2 or arterial oxygen saturation drops or $PaCO_2$ rises. Administer endotracheal intubation and mechanical ventilation if needed" (Phelps, 2022).	**Interventions** **Intervention 1:** "Weigh patient daily before breakfast, as ordered, to provide consistent readings. Check for signs of fluid retention, such as dependent edema, sacral edema, and ascites" (Phelps, 2022). **Intervention 2:** Educate the patient on safe fluid restriction and a proper diet (Phelps, 2022). Explain to the patient they should not exceed 1,800 mL in one day and that he should be consuming a low sodium and low cholesterol diet and limit his alcohol consumption.	**Interventions** **Intervention 1:** "Identify factors that may cause or contribute to injury from a fall in order to enhance the patient, family, and caregiver awareness of the risks" (Phelps, 2022). **Intervention 2:** "Review medications with patient and family. Help the patient understand which medications put the patient at a greater risk for falls. Knowing the risk may help the patient take more care in moving about" (Phelps, 2022). Explain to the patient that amlodipine and carvedilol are 2 medications on his regimen that increase his risk of falling.
Evaluation of Interventions The patient was receptive and responded well to the interventions chosen. The patient demonstrated his knowledge and understanding by explaining the importance of obtaining his oxygen saturation, and respiration rate, auscultating his lungs every 4 hours, and monitoring his ABG levels.	**Evaluation of Interventions** The patient was receptive and responded well to the interventions chosen. The patient demonstrated his knowledge and understanding by explaining the importance of obtaining daily weights and by explaining the diet he should adhere to.	**Evaluation of Interventions** The patient was receptive and responded well to the interventions chosen. The patient demonstrated his knowledge and understanding by identifying factors that increase his chances of falling and identifying the medications that are on his regimen that will increase his chances of falling also.

References (3) (APA):

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Phelps, L. (2022). *Nursing diagnosis reference manual* (12th ed.). Wolters Kluwer.