Firelands Regional Medical Center School of Nursing
AMSN 2024
Unit 6: Heart Failure online assignment (1.5H)

Directions:

- Read Lewis Chapter 38, review ATI Pharmacology Made Easy 4.0: Cardiovascular Module: Drug Therapy for Heart Failure, and review the Unit 6 Pharmacology List.
- Utilizing the resources above, complete the case study. There will be many items for each question.
- Utilizing the Pharmacology List and ATI/Skyscape, complete three ATI Medication Templates from the Pharmacology List.
- This assignment is due in the Unit 6: HF assignment drop box by March 11, 2024 at 0800.
- Be prepared to discuss this assignment in class.
- You must complete the assignment in full to receive the 1.5H theory credit.

Assignment Objectives:

- Determine overall goals in the treatment of heart failure.

CASE STUDY:

Frannie Failure, a patient on 4P, calls the nurse and states, "I feel really puffy. My rings feel so tight on my fingers and I am having trouble catching my breath." The patient is lying flat in the bed and is alert and oriented x 3. Normal saline 0.9% @ 125mL/HR is running.

Assessment:

- Vital Signs: T 97.9 oral, HR 120, RR 24, SpO2 86% RA, BP 152/94, pain 0/10.
- Respiratory: Lung sounds- crackles throughout bilaterally, non-productive cough.
- Cardiac: Heart sounds- S3, pedal pulses not palpable, 3+ pitting edema bilateral feet and ankles.
- Skin intact, pale and cool.
- Gastrointestinal: Bowel sounds x4 WNL, BM yesterday morning.
- Intake/Output: Patient has had 900ml in and 200ml out over the last 8 hours.

1. **What additional information would you want/need to know**?
   You would want to also know what the patient's past medical history is, as this could help determine any potential risk factors for developing heart failure. Knowing if the patient has any allergies could help guide if there are any treatment options that could be contraindicated for them. You should ask the patient if they have experienced these symptoms before to determine if this is a new onset of symptoms or something she has dealt with before. You would also want to know the patient's most recent lab values to see if there are any electrolyte imbalances occurring. Checking if the patient has had any diagnostic studies completed already can help determine what has already been performed and what may still need to be done.
2. **What assessment/ interventions would be appropriate for this patient?**

You would perform a complete cardiovascular and respiratory assessment, but this had already been completed. In order to manage heart failure in a patient, it is important to determine what the patient's risk factors are and come up with a plan with the patient to reduce them. As the patient stated they are experiencing shortness of breath, you would want to raise the head of the bed to a high Fowler's position and get a doctor's order for oxygen via nasal cannula. The patient will most likely need noninvasive positive pressure ventilation. Regarding the bilateral edema she is experiencing in her feet and ankles, you could give the patient a diuretic to help release some of the extra fluid. You would want to check her most recent labs before giving a diuretic as she may need a potassium-sparing diuretic if her potassium is low. Although she does not currently have any pain, if any pain were to start you would want to treat this promptly. When the provider orders a procedure, assisting the provider with prepping the patient and other tasks is another intervention that will be needed. You should assess if the patient has any jugular venous distention to determine if there is an elevated left ventricle filling pressure. Checking the patient's cough and looking at the characteristics of sputum that may be produced is also important. Checking urine output is another intervention to perform. Connecting the patient to a 12-lead ECG can help display if the patient is currently having any dysrhythmias. Circulatory assist devices would be implemented and maintained, as well as continuously monitoring pulse oximetry, ECG readings, vital signs, weight, mental status, and indicators of volume overload and decreased organ perfusion. Endotracheal intubation and mechanical ventilation may be needed, so assessments of this would need to be implemented. If the patient is stable, she will be able to be treated in the emergency department or in a telemetry unit. Unstable patients will be treated in the ICU. Certain interventions will be determined based on the unit the patient is being treated in.

3. **What would you anticipate the healthcare provider to order?**

   You would anticipate the provider ordering serum chemistries, cardiac biomarkers, BNP or NT-proBNP level, liver function tests, thyroid function tests, CBC, lipid profile, kidney function tests, and a urinalysis. Along with this, a chest x-ray, 12-lead ECG, 2-dimensional echocardiogram, nuclear imaging studies, and cardiac catheterization are anticipated. For acute heart failure, the provider would want to measure left ventricle function, hemodynamic monitoring, and possibly an endomyocardial biopsy (this is only in select patients).

4. **What medications would be appropriate for this patient (include all pertinent from the Pharmacology List)? Doses? Nursing Interventions? <u>You will pick three of these medications to complete the ATI Medication Templates.</u>**

   For this patient, medications that would be appropriate include diuretics (furosemide, bumetanide, hydrochlorothiazide, spironolactone; furosemide is preferred first-line treatment), vasodilators (nitroglycerin, nesiritide if other diuretics failed), morphine, and positive inotropes (dopamine, dobutamine, milrinone). She may need long-term treatment after this to manage her heart failure.

   Medications:

   - Furosemide (preferred diuretic):
     - Dosage:

        - EDEMA: PO; 20-80 mg/day as a single dose initially, may repeat in 6-8 hours. May increase dose by 20-40mg every 6-8 hours until desired response. IM, IV; 20-40 mg, may repeat in 1-2 hours and increase by 20 mg every 1-2 hours until response is obtained. Maintenance dose may be given every 6-12 hours. Continuous infusion- bolus 0.1 mg/kg followed by 0.1 mg/kg/hour, double every 2 hours to a maximum of 0.4 mg/kg/hour.
        - HYPERTENSION: 40 mg twice daily initially (when added to regimen, decrease dose of other antihypertensives by 50%); adjust further dosing based on response.
    - Interventions:
        - Assess fluid status. Monitor daily weight, intake and output ratios, amount and location of edema, lung sounds, skin turgor, and mucous membranes. Notify health care professional if thirst, dry mouth, lethargy, weakness, hypotension, or oliguria occurs.
        - Monitor BP and pulse before and during administration.
        - If patient is of geriatric age, assess falls risk and implement fall prevention strategies.
        - Assess for tinnitus and hearing loss.
        - Assess for allergy to sulfonamides.
        - Assess patient for skin rash frequently during therapy. Discontinue drug at first sign of rash, as it may be life-threatening.
        - Monitor electrolytes, renal and hepatic function, serum glucose, and uric acid levels before and periodically throughout therapy.
- Bumetanide:
    - Dosage: PO; 0.5-2 mg/day given in 1-2 doses: titrate to desired response (maximum daily dose 10 mg/day). IM, IV; 0.5-1 mg/dose, may repeat every 2-3 hours as needed (up to 10 mg/day).
    - Interventions:
        - Assess fluid status during therapy. Monitor daily weight, intake and output ratios, amount and location of edema, lung sounds, skin turgor, and mucous membranes. Notify health care professional if thirst, dry mouth, lethargy, weakness, hypotension, or oliguria occurs.
        - Monitor BP and pulse before and during administration.
        - Assess for tinnitus and hearing loss.
        - Assess for allergy to sulfonamides.
        - Assess patient for skin rash frequently during therapy. Discontinue drug at first sign of rash, may be life-threatening.
        - If patient is of geriatric age, assess falls risk and implement fall prevention strategies.
        - Monitor electrolytes, renal and hepatic function, serum glucose, and uric acid levels before and periodically during therapy.

- Hydrochlorothiazide:
    - Dosage: PO; 12.5-100 mg/day in 1-2 doses (up to 200 mg/day; not to exceed 50mg/day for hypertension).
    - Interventions:
        - Monitor BP, intake, output, and daily weight and assess feet, legs, and sacral area for edema daily.
        - If hypokalemia occurs, consideration may be given to potassium supplementation or decreasing dose of diuretic.
        - Assess patient for allergy to sulfonamides.
        - Assess patient for skin rash frequently during therapy. Discontinue drug at first sign of rash, may be life-threatening.
        - Monitor electrolytes (especially potassium), blood glucose, BUN, serum creatinine, and uric acid levels before and periodically during therapy.
- Spironolactone:
    - Dosage:
        - HF: PO; Serum potassium less than or equal to 5 mEq/L and eGFR greater than 50 mL/minute/1.73 m2- tablet: 25 mg once daily; may then increase to 50 mg once daily; if develop hyperkalemia with 25 mg once daily, decrease dose to 25 mg every other day. Suspension: 20 mg once daily; may then increase to 37.5 mg once daily; if develop hyperkalemia with 20 mg once daily, decrease dose to 20 mg every other day. Serum potassium less than or equal to 5 mEq/L and eGFR 30-50 mL/minute/1.73 m2- tablets: 25 mg every other day. Suspension: 10 mg once daily.
        - HTN: PO; tablets: 25-100 mg/day as a single dose or 2 divided doses; may titrate dose every 2 weeks (max dose 100 mg/day). Suspension: 20-75 mg/day as a single dose or 2 divided doses; may titrate dose every 2 weeks (max dose 75 mg/day).
        - EDEMA: PO; tablets: 25-200 mg/day as a single dose or 2 divided doses. Suspension: 75 mg/day as a single dose or 2 divided doses.
    - Interventions:
        - Monitor intake and output ratios and daily weight during therapy.
        - If medication is given as an adjunct to antihypertensive therapy, evaluate BP before administering and periodically during therapy.
        - Assess patient frequently for development of hyperkalemia. Patients who have diabetes mellitus or kidney disease and elderly patients are at increased risk.
        - Periodic ECGs may be recommended in patients receiving prolonged therapy.
        - Assess patient for skin rash frequently during therapy. Discontinue drug at first sign of rash, may be life-threatening.

        - Evaluate serum potassium levels prior to, within 1 week of starting therapy or dose increase, and routinely during therapy. If hyperkalemia occurs, decrease dose or discontinue therapy and treat hyperkalemia.
        - Monitor BUN, serum creatinine, and electrolytes prior to and periodically during therapy.
        - Discontinue potassium-sparing diuretics 3 days prior to a glucose tolerance test.
- Nitroglycerin:
    - Dosage:
        - PO: 2.5-9 mg every 8-12 hours.
    - Interventions:
        - Monitor BP and pulse before and after administration.
- Nesiritide:
    - Dosage:
        - IV: 2 mcg/kg bolus followed by 0.01 mcg/kg/minute as a continuous infusion. May increase by 0.005 mcg/kg/minute every 3 hours up to a maximum infusion rate of 0.03 mcg/kg/minute (based on response).
    - Interventions:
        - Monitor BP, pulse, ECG, respiratory rate, cardiac index, PCWP, and central venous pressure frequently during administration. May cause hypotension, especially in patients with a BP <100 mmHg. Reduce dose or discontinue drug if patient develops hypotension. Hypotension may cause renal compromise. Use IV fluids and changes in body position to support BP if symptomatic hypotension occurs. Nesiritide may be restarted at a dose reduced by 30% with no bolus administration once patient is stabilized. Hypotension may be prolonged for hours, requiring a period of monitoring prior to restarting administration.
        - Monitor intake and output and weigh daily. Assess for decrease in signs of HF.
        - Obtain history for reactions to recombinant peptides; may increase risk of allergic reaction. Observe patient for signs and symptoms of allergic reactions. Discontinue the drug and notify health care professional immediately if these occur. Keep epinephrine, IV fluids, pressure amines, and resuscitation equipment close by in the event of an anaphylactic reaction.
        - Monitor BUN and serum creatinine.
- Morphine:
    - Dosage:
        - IV: bolus doses of 2.5-5 mg, repeat as necessary.
    - Interventions:

        - Assess LOC, BP, pulse, and respirations before and periodically during administration.
        - Monitor for respiratory depression, especially during initiation or following dose increase.
        - Assess bowel function routinely. Institute prevention of constipation with increased intake of fluids and bulk and with laxatives to minimize constipating effects. Assess risk for opioid addiction, abuse, or misuse prior to administration.
        - If toxicity detected, administer reversal agent (naloxone).
- Dopamine:
    - Dosage:
        - IV: dopaminergic effects- 1-5 mcg/kg/minute continuous infusion. Beta-adrenergic effects- 5-15 mcg/kg/minute. Alpha-adrenergic effects- >15 mcg/kg/minute continuous infusion; infusion rate may be increased as needed.
    - Interventions:
        - Monitor BP, heart rate, pulse pressure, ECG, PCWP, cardiac output, CVP, and urinary output continuously during administration. Report significant changes in vital signs or arrhythmias. Consult physician for parameters for pulse, BP, or ECG changes for adjusting dose or discontinuing medication.
        - Monitor urine output frequently throughout administration. Report decreases in urine output promptly.
        - Palpate peripheral pulses and assess appearance of extremities routinely during dopamine administration. Notify physician if quality of pulse deteriorates or if extremities become cold or mottled.
        - If hypotension occurs, administration rate should be increased. If hypotension continues, more potent vasoconstrictors (norepinephrine) may be administered.
        - If excessive hypertension occurs, rate of infusion should be decreased or temporarily discontinued until BP is decreased.
- Dobutamine:
    - Dosage:
        - IV: 2.5-15 mcg/kg/minute; titrate to response (max dose 40 mcg/kg/min).
    - Interventions:
        - Monitor BP, heart rate, ECG, PCWP, cardiac output, CVP, and urinary output continuously during the administration. Report significant changes in vital signs or arrhythmias. Consult physician for parameters for pulse, BP, or ECG changes for adjusting dose or discontinuing medication.
        - Palpate peripheral pulses and assess appearance of extremities routinely during dobutamine administration. Notify health care professional if quality of pulse deteriorates or if extremities become cold or mottled.

        - Monitor potassium concentrations during therapy.
        - Monitor electrolytes, BUN, creatinine, and prothrombin time weekly for prolonged therapy.
        - If overdose occurs, reduction or discontinuation of therapy is the only treatment necessary.
- Milrinone:
    - Dosage:
        - IV: loading dose- 50 mcg/kg followed by continuous infusion at 0.5 mcg/kg/minute (range 0.375-0.75 mcg/kg/minute).
    - Interventions:
        - Monitor heart rate and BP continuously during administration. Slow or discontinue if BP drops excessively.
        - Monitor intake and output and daily weight. Assess patient for resolution of signs and symptoms of HF and improvement in hemodynamic parameters. Correct effects of previous aggressive diuretic therapy to allow for optimal filling pressure.
        - Monitor ECG continuously during infusion. Arrhythmias are common and may be life threatening.
        - Monitor electrolytes and renal function frequently during administration. Correct hypokalemia prior to administration to decrease the risk of arrhythmias.
        - Monitor platelet count during therapy.
        - Overdose manifests as hypotension. Dose should be decreased or discontinued. Supportive measures may be necessary.

5. **What patient education would you include?**

When caring for the patient, you would want to educate her about any procedures she has to undergo such as a cardiac catheterization or echocardiogram to determine the location and severity of the problem. You would also want to educate her about what heart failure is and how it is causing her symptoms. For each medication prescribed based on the patient's status, you would educate her about the simplified mechanism of action, what side effects to watch for, when to contact her provider, signs of drug toxicity, and what to avoid for the best therapeutic effects. You should explain to the patient how their heart failure can progress into further symptoms if they are not compliant with their treatment regimen. Educating the patient about a heart healthy diet is important too that involves low sodium, as choosing healthier meal options can help reduce some of the workload on the heart. You will want to teach the patient how to read nutrition labels so they can understand how to avoid foods that are high in sodium. Recommend weight management and exercise as well as getting recommended vaccinations. Refer the patient to community resources if they are not able to follow this plan themselves or if they are having financial struggles that make treatment adherence difficult. Before the patient is

discharged, make sure they know they need to effectively monitor their heart rate and blood pressure regularly and how to do so correctly.