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3/8/2023

Firelands Regional Medical Center School of Nursing
AMSN 2023
Unit 6: Heart Failure online assignment (1.5H)

Directions:

- Read Lewis Chapter 34, 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 13, 2023 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. NS @ 125mL/HR 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.

1. **What additional information would you want to know**?
   I would want to know a full history of the patient and what they came to the hospital for. I would also want to know when the crackles in his lungs were first noticed and if the physician was aware. I would also ask about the time that the fluids began and how much time has gone by for the 900mL input. I would also want to know about the patient's family history in case they have a history of heart failure or other related issues.
2. **What assessment/ interventions would be appropriate for this patient?**
   I would hold the fluids and call the physician. I would intervene by raising the head of the patient's bed to help them breathe easier.
3. **What would you anticipate the healthcare provider to order?**

I would anticipate the HCP to determine the underlying cause by looking at the patient's history and their physical examination. I would also expect the HCP to order drug therapy to help treat the fluid over load, daily weights, a sodium and possibly a fluid restricted diet, and oxygen NC if needed. I would also anticipate the HCP to order labs and tests such as serum chemistries, cardiac biomarkers, BNP, liver function tests, thyroid function tests, CBC, lipid profile, kidney function tests, and a urinalysis. I would anticipate tests such as a chest x-ray and a 12 lead ECG. I would anticipate the patient to remain in high fowlers position, frequent vitals signs, and urine output q1hr until stable, continuous ECG and pulse oximetry monitoring. I would anticipate the physician to order a diuretic, such as spironolactone.

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>**

<u>Appropriate medications for this patient:</u>

1. Ace inhibitors (Enalapril)-

- Dilate venules and arterioles, may relieve HF symptoms, promote reverse remodeling, improve renal blood flow, may reduce morbidity, mortality, and HF hospitalizations in patients with chronic HF.
- Heart Failure- PO Adults: 2.5mg 1-2 times daily, titrated up to target dose of 10 mg twice daily.
- Nursing interventions:
    - Monitor weight and assess patient routinely for resolution of fluids overload (edema, SOB, crackles)
    - Monitor patient's renal function. Medication may cause and increased BUN and Creatine.

2. ARBs (Losartan)-

- Dilate venules and arterioles, may relieve HF symptoms, promote reverse remodeling, improve renal blood flow, may reduce morbidity, mortality, and HF hospitalizations in patients with chronic HF.
- HTN- Initiate therapy at 25mg once daily in patients who are receiving diuretics or are volume depleted.
- Nursing Interventions: Assess BP (lying, sitting, standing) and pulse frequently during initial dose adjustment and periodically therapy. Notify HCP of significant changes. Monitor frequency of prescription refills to determine compliance. Assess for signs of angioedema (dyspnea, facial swelling). Monitor renal function, may cause increased BUN and serum creatine.

3. Digoxin

- May reduce HF symptoms and hospitalization if added to the stand therapy for chronic HF
- IV,IM Adults- Digitalizing dose- 0.5-1mg given as 50% of the dose initially and one quarter of the initial dose in each of 2 subsequent doses at 6-12 hr intervals

- PO Adults- Digitalizing dose- 0.75-1.5mg given as 50% of the dose initially and one quarter of the initial dose in each of 2 subsequent doses at 6-12 hour intervals. Maintenance dose- 0.125-0.5mg/day depending on patients lean body weight, renal function, and serum level.
- Nursing Intervention: Monitor apical pulse for 1 full minute before administering. Withhold dose and notify HCP if pulse rate is <60bpm in and adult. Notify HCP promptly of any significant changes in rate, rhythm, or quality of pulse. Monitor BP periodically in patients receiving IV digoxin. Monitor ECG changes during IV administration and 6 hr after each dose. Notify HCP if bradycardia or new arrhythmias. Observe IV site for redness or infiltration; extravasation can lead to tissue irritation and sloughing. Monitor intake and output ratios and daily weights. Assess for pheripheral edema, and auscultate lungs for rales/crackles throughout therapy.

4. Diltiazem

- Helps control HTN
- PO Adults- 30-120mg 3-4 times daily or 180-240mg once daily as CD or XR capsules or LA tablets (up to360 mg/day); concurrent simvastatin therapy- Diltiazem dose should not exceed 240mg;day and simvastatin dose should not exceed 10mg/day
- Nursing Interventions: Monitor BP and pulse prior to therapy, during dose titration, and periodically during therapy. monitor ECG periodically during prolonged therapy may cause prolonged PR intervals. Monitor intake and output ratios and daily weight. Assess for signs of heart failure (peripheral edema, rales/crackles, dyspnea, weight gain, JVD). Monitor frequency of prescription refills to determine adherence. Patients receiving digoxin can currently with calcium channel blockers should have routine serum Digoxin levels checked and be monitored for signs and symptoms of digoxin toxicity. Assess for rash periodically during therapy. May cause Stevens-Johnson syndrome. Discontinue therapy if severe or accompanied with fever, general malaise, fatigue, muscle or joint aches, blisters, lesions, conjunctivitis, hepatitis and/or eosinophilia. Monitor ECG continuously during administration. Report bradycardia or prolonged hypotension promptly. Emergency equipment and medication should be available. Monitor BP and pulse before and frequently during administration. Monitor serum potassium periodically. Hypokalemia increases the risk of arrhythmias and should be corrected. Monitor renal and hepatic functions periodically during long-term therapy. May cause an increase in hepatic enzymes after several days of therapy, which return to normal on discontinuation of therapy.

5. Dobutamine/Dopamine

- Increase cardia output, BP, and improved renal blood flow
- Dopamine-IV Adults - Dopaminergic (renal vasodilation) effects- 1-5mcg/kg/min. Continuous infusion. Beta-adrenergic (cardiac stimulation) effects- 5-15 mcg/kg/min. Alpha-adrenergic (increased peripheral vascular resistance) effects - >15 mcg/kg/min continuous infusion; infusion rate may be increased as needed.
- Dobutamine- IV Adults- 2.5-15 mcg/kg/min; titrate to response (max dose =40 mcg/kg/min).
- Nursing Interventions: Monitor bp, heart rate, ECG, pulmonary capillary wedge pressure, cardiac output, CVP, and urinary output continuously during the administration. Report significant changes in vital signs or arrhythmias. Consult position for perimeters for pulse, BP, or ECG changes for adjusting dose or discontinuing medication. Palpate peripheral pulses and assess the appearance of extremities routinely during Dobutamine/Dopamine administration. Notify HCP if the quality of pulse deteriorates or if extremities become cold or mottled. Monitor potassium

concentrations during therapy; may cause hypokalemia. Monitor electrolytes, bun, creatinine, and prothrombin time weekly during prolonged therapy. If hypotension occurs with dopamine, administration rate should be increased. If hypotension continues, more potent vasoconstrictors (norepinephrine) may be administered.

6. Entresto

- Reduction in cardiovascular death and hospitalizations due to HF in adults.
- PO Adults- Sacubitril 49 mg/valsartan 51 mg twice daily initially; double dose in 2-4 weeks to target dose of sacubitril 97mg/valsartan 103 mg as tolerated. Patients not currently receiving Angiotensin-converting enzyme inhibitors or Angiotensin receptor blockers or receiving a low dose of these agents- Sacubitril 24 mg/ Valsartan 26 mg twice daily initially; double dose every 2-4 weeks to target dose of Sacubitril 97 mg/ Valsartan 103 mg as tolerated.
- Nursing Interventions: Assess BP (lying, sitting, standing), and pulse frequently during initial dose adjustment and periodically throughout therapy. correct volume or salt depletion prior to administration of therapy. if hypotension occurs, consider reducing dose of diuretics, concomitant antihypertensive agents, and treatment of other causes of hypotension. If hypotension persists, reduce the dose or temporarily discontinue therapy. Monitor daily weight and assess patient routinely for resolution of fluid overload. Monitor frequency of prescription refills to determine compliance. Assess patients for signs of angioedema. Monitor renal function may cause an increase in bun and serum creatinine.

7. Furosemide/ Bumetanide

- Diuresis and subsequent mobilization of excess fluid/ decrease BP
- Furosemide PO Adults- 20-80 mg/day as a single dose initially, may repeat in 6-8 hours; may increase dose by 20-40 mg every 6-8 hours until desired response. maintenance doses may be given once or twice daily(doses up to 2.5g/day have been used in patients with HF or renal disease). hypertension- 40 mg twice daily initially (when added to regimen, decreased dose of other antihypertensives by 50%); adjust further dosing based on response; hyperkalemia- 120 mg/day in 1-3 doses.
  Furosemide IM/IV Adults- 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/hr, double every 2 hours to a maximum of 0.4 mg/kg/hr.
  Bumetanide PO Adults- 0.5-2 mg/day given in 1-2 doses; titrate to desired response(maximum daily dose = 10mg/day).
  IM/IV Adults- 0.5-1 mg/dose, may repeat every 2-3 hours as needed (up to 10mg/day).

- Nursing Interventions: Assess fluid status. Monitor daily weight, intake and output ratio, amount and location of edema, lung sounds, skin turgor, and mucous membranes. notify hcp if thirst, dry mouth, lethargy, weakness, hypotension, or oliguria occurs. Monitor BP and pulse before and during administration. Monitor the frequency of prescription refills to determine compliance and patients treated for hypertension. Assess patients receiving digoxin for anorexia, nausea, vomiting, muscle cramps, paresthesia, and confusion. patients taking Digoxin are at an increased risk of digoxin toxicity because of the potassium-depleting effect of the diuretic. potassium supplements or potassium-sparing diuretics may be used concurrently to prevent hypokalemia. Assess patient for skin rash frequently during therapy. Discontinue furosemide at first sign of rash; may be life-threatening. Monitor electrolytes, renal and hepatic

function, serum glucose, and uric acid levels before and periodically throughout therapy. Commonly decreases serum potassium. May cause a decrease in serum sodium, calcium, and magnesium concentrations. May also cause an increase in BUN, serum glucose, serum creatinine, and uric acid levels.

8. Hydrochlorothiazide

- Lowering BP in hypertensive patients and diuresis with mobilization of edema
- PO Adults- 12.5- 100 mg/day in 1-2 doses (up to 200 mg/day; not to be exceeded 50 mg/day for hypertension; doses above 25 MGR associated with a greater likelihood of electrolyte abnormalities).
- Nursing Interventions: Monitor BP, intake, output, and daily weight and assess feet, legs, and sacral area for edema daily. Assess the patient, especially if taking digoxin, for anorexia, nausea, vomiting, muscle cramps, paresthesia, and confusion. Notify HCP if these signs of electrolyte imbalance occur. Patients taking digitalis glycosides are at risk of digitalis toxicity because of the potassium-depleting effect of the diuretic. If hypokalemia occurs, consideration may be given to potassium supplementation or decreasing dose of diuretic. Assess patient for skin rash frequently during therapy. Discontinue diuretic at first sign of rash; may be life-threatening. For hypertension monitor BP before and periodically during therapy. Monitor electrolytes especially potassium, blood glucose, BUN, serum creatinine, and uric acid levels before and periodically during therapy.

9. Beta Blockers (Metoprolol)

- Decrease BP and heart rate/ Decreased rate of cardiovascular mortality and hospitalization in patients with heart failure.
- PO (Adults): Hypertension/angina — 25–100 mg/day as a single dose initially or 2 divided doses; may be UpArrow.gif every 7 days as needed up to 450 mg/day (immediate-release) or 400 mg/day (extended-release) (for angina, give in divided doses). Extended-release products are given once daily. MI — 25–50 mg (starting 15 min after last IV dose) every 6 hr for 48 hr, then 100 mg twice daily. Heart failure — 12.5–25 mg once daily (of extended-release), can be doubled every 2 wk up to 200 mg/day. Migraine prevention — 50–100 mg 2–4 times daily (unlabeled).
  IV (Adults): MI — 5 mg every 2 min for 3 doses, followed by oral dosing.
- Nursing Interventions: Monitor BP, ECG, and pulse frequently during dose adjustment and periodically during therapy. Monitor frequency of prescription refills to determine compliance. Monitor vital signs and ECG every 5–15 min during and for several hours after parenteral administration. If heart rate <40 bpm, especially if cardiac output is also decreased, administer atropine 0.25–0.5 mg IV. Monitor intake and output ratios and daily weights. Assess routinely for signs and symptoms of HF (dyspnea, rales/crackles, weight gain, peripheral edema, jugular venous distention). May cause an increase in BUN, serum lipoprotein, potassium, triglyceride, and uric acid levels.

10. Nesiritide

- Dose-dependent reduction in pulmonary capillary wedge pressure (PCWP) and systemic arterial pressure in patients with heart failure with resultant decrease in dyspnea.
- IV (Adults): 2 mcg/kg bolus followed by 0.01 mcg/kg/min as a continuous infusion. May UpArrow.gif by 0.005 mcg/kg/min every 3 hr up to a maximum infusion rate of 0.03 mcg/kg/min (based on response).
- Nursing 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 mm Hg. Reduce dose or discontinue nesiritide 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 (dyspnea, rales/crackles, peripheral edema, weight gain). Obtain history for reactions to recombinant peptides; may increase risk of allergic reaction. Observe patient for signs and symptoms of allergic reactions (rash, pruritus, laryngeal edema, wheezing). Discontinue the drug and notify health care professional immediately if these occur. Keep epinephrine, an antihistamine, IV fluids, pressure amines, and resuscitation equipment close by in the event of an anaphylactic reaction. Monitor BUN and serum creatinine. May cause UpArrow.gif in serum creatinine; UpArrow.gif serum creatinine may be dose-related.

11. Spironolactone

- New York Heart Association (NYHA) class III-IV HF/Hypertension/Edema associated with cirrhosis and nephrotic syndrome/Primary hyperaldosteronism (tablets only).
- PO (Adults): Serum potassium le.gif5 mEq/L and eGFR>50 mL/min/1.73 m2 — Tablet: 25 mg once daily; may then UpArrow.gif to 50 mg once daily; if develop hyperkalemia with 25 mg once daily, DnArrow.gif dose to 25 mg every other day. Suspension: 20 mg once daily; may then UpArrow.gif to 37.5 mg once daily; if develop hyperkalemia with 20 mg once daily, DnArrow.gif dose to 20 mg every other day. Serum potassium le.gif5 mEq/L and eGFR 30–50 mL/min/1.73 m2 — Tablets: 25 mg every other day. Suspension: 10 mg once daily. Edema-PO (Adults): 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.
- Nursing 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 (fatigue, muscle weakness, paresthesia, confusion, dyspnea, cardiac arrhythmias). Patients who have diabetes mellitus or kidney disease and elderly patients are at increased risk of developing these symptoms. Periodic ECGs may be recommended in patients receiving prolonged therapy. Assess patient for skin rash frequently during therapy. Discontinue diuretic at first sign of rash; may be life-threatening. Stevens-Johnson syndrome or toxic epidermal necrolysis may develop. Treat symptomatically; may recur once treatment is stopped. Evaluate serum potassium levels prior to, within 1 wk 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. May cause UpArrow.gif serum magnesium, uric acid, BUN, creatinine, potassium, plasma renin activity, and urinary calcium excretion levels. May also cause DnArrow.gif sodium levels.

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

I would provide education about all of the patient's medications and why they are receiving each one. I would also educate on the importance of medication compliance. I would also include patient information on what Heart Failure is and how to treat it. I would communicate with the patient the primary causes of heart failure and their risk factors, including their genetic link. It is important to educate on modifiable risk factors. When teaching the patient about heart failure it is important to include activity. The patient should increase walking and other activities gradually, provided they do not cause fatigue or dyspnea. They should consider a cardiac rehabilitation program, and avoid extremes of heat and cold. Looking at dietary therapy, the patient should consult the diet plan and list of permitted and restricted foods. They should adhere to specific sodium restriction guidelines outlined by the healthcare provider. They should examine labels to determine sodium content and also examine the labels of over-the-counter drugs, such as laxatives, cough medicines, and anti-acids for sodium content. The patient should avoid using salt when preparing foods or adding salt to foods. The patient should weigh themselves at the same time each day, preferably in the morning, using the same scale and wearing similar clothes. The patient should also eat small frequent meals. Focusing on ongoing monitoring, the patient should know the signs and symptoms of worsening heart failure, including increasing dyspnea, orthopnea, weight gain, edema, fluid retention, fatigue, and tiredness with physical activity. The patient should recall the symptoms when the illness began. The reappearance of previous symptoms may indicate a reoccurrence. The patient should report the following symptoms to the healthcare provider immediately:

- weight gain of 3 lb in 2 days, or 3-5 in a week,
- difficulty breathing, especially with activity or when lying flat
- waking up breathless at night
- frequent dry, hacking cough, especially when lying down
- fatigue, weakness
- swelling of ankles, feet, or abdomen. swelling of the face or difficulty breathing if taking ACE inhibitors
- nausea with abdominal swelling, pain, and tenderness
- dizziness or fainting

It is important to help the patient promote their own health by obtaining an annual influenza vaccination, obtaining a pneumococcal vaccine, and developing a plan to reduce risk factors. it is also important for the nurse to teach the patient about rest. they should plan a regular daily rest and activity program. after exertion such as exercise and ADLs, it is important for the patient to plan a rest. they could also consider shorter working hours or schedule rest periods during working hours. it is important to avoid emotional upset and share any concerns fears or feelings of depression with the HCP.