Medical Diagnosis/ Disease: Chronic Kidney Disease

NCLEX IV *(8)*: Physiological Integrity/Physiological Adaptation

Anatomy and Physiology
Normal Structures
Page attached.

Pathophysiology of Disease
Progressive, irreversible loss of kidney function. Kidney damage or a low GFR of <60 for 3 months or longer. Usually not recognized until late with a large loss of nephrons because the kidneys can adapt at first. The remaining nephrons compensate -> hypertrophy. It occurs when a disease/condition impairs kidney function causing kidney damage. High blood pressure can damage blood vessels which can cause a reduced blood supply to the kidneys, and it could damage the glomeruli. As kidney function deteriorates, all body systems will be affected. The symptoms are due to retained urea, creatinine, phenols, hormones, electrolytes, and water. These are being retained because the kidneys aren't able to filter the waste and fluids and remove them effectively causing them to build up in your body. Usually when the GFR is <15, the patient will have uremia.

NCLEX IV *(7)*: Reduction of Risk

Anticipated Diagnostics
Labs
Dipstick evaluation, UA
BUN, serum creatinine,
Creatinine clearance levels
Serum electrolytes
Lipid profile
Hgb and Hct
GFR
Albumin to creatinine ratio

Additional Diagnostics
Renal ultrasound
Kidney biopsy
Renal scan
CT scan
Bone biopsy

NCLEX II *(3)*: Health Promotion and Maintenance

Contributing Risk Factors
Diabetes
Hypertension
Glomerulonephritis
Urologic diseases
Cystic diseases
Age: >60 years
Cardiovascular disease
Exposure to nephrotoxic drugs
Family history of CKD

Signs and Symptoms
Polyuria, oliguria
Fluid retention – late
Hyperglycemia
Hyperinsulinemia
Anxiety
Hypertension, heart failure
CAD
Nausea, vomiting, anorexia
Anemia, infection, bleeding
Fatigue, headache
Pulmonary edema
Sleep problems
Short of breath, chest pain
Persistent proteinuria

NCLEX IV *(7)*: Reduction of Risk

Possible Therapeutic Procedures
Non-surgical
Hemodialysis, peritoneal dialysis
Blood transfusion

Surgical
Parathyroidectomy
Kidney transplant
Port placement, fistula or graft for dialysis

Prevention of Complications
(What are some potential complications associated with this disease process)
Mineral + Bone disorders – limiting dietary phosphorus, phosphate binders, Vit D supplements
Drug toxicity – doses adjusted based on severity of disease
Calorie-protein malnutrition – dietary consult
Hyperkalemia – medications, dietary changes
Pericarditis
Anemia – supplements, transfusions, dietary changes

NCLEX IV *(6)*: Pharmacological and Parenteral Therapies

Anticipated Medication Management
Hyperkalemia: calcium gluconate IV,
Patiromer, regular insulin IV + IV glucose (to prevent hypoglycemia), sodium bicarbonate, sodium polystyrene sulfonate
Antihypertensive drugs – ace inhibitors, ARBs, CCB
Mineral- bone disorders: Vit D and calcium supplements, phosphate binders
Anemia: erythropoietin therapy, iron supplements, folic acid supplements
Dyslipidemia: statins – atorvastatin and fibrates
Diuretics – furosemide. Digoxin.

NCLEX IV *(5)*: Basic Care and Comfort

Non-Pharmacologic Care Measures
Restricting foods high in potassium – 40 mEq/day
Weight loss – exercise, diet changes (DASH)
Smoking and alcohol cessation
Checking orthostatic vital signs
Protein drinks
I&O
Sodium and fluid restriction

NCLEX III *(4)*: Psychosocial/Holistic Care Needs

What stressors might a patient with this diagnosis be experiencing?
Lifestyle changes – diet, exercise, smoking + alcohol cessation
Time commitment for dialysis
Money/job – dialysis during the week or having to stop working
Being away from family

Client/Family Education

List 3 potential teaching topics/areas
- If being given Kayexalate, expect diarrhea
- How to check blood pressure at home
- Iron supplements can cause dark stools and constipation. It's best when taken with orange juice.

NCLEX I *(1)*: Safe and Effective Care Environment

Multidisciplinary Team Involvement
(Which other disciplines do you expect to share in the care of this patient)
Nephrologist
Cardiologist
Hematologist
Dietician
Primary care provider
Dialysis nurses + provider
Case manager

Anticipated Patient Problems, Goals, & Interventions Based on Medical Diagnosis

** This worksheet should be completed before you begin the ATI simulation.

Problem #1: Excess fluid volume

Patient Goals:

1. Client will have a urinary output of at least 30ml/hour during my time of care.
2. Client will have a normal blood pressure (120/80), will have no edema in lower extremities, and will have no shortness of breath during my time of care.

Assessments:

- Assess intake and output q1hour. Assess BP, HR, RR, and oxygen saturation q4hours and PRN. Assess for edema q4hours. Assess weight qshift. Assess for changes in mental status PRN. Assess lung sounds q4hours. Assess skin turgor q4hours. Assess BUN/Cr, GFR, and electrolytes PRN. Assess orthostatic vital signs qshift.

Interventions (In priority order):

1. Administer furosemide as ordered during my time of care.
2. Assist the client to dialysis as ordered during my time of care.
3. Educate client on the importance of their fluid and sodium restriction PRN during my time of care.
4. Educate client on the importance of having orthostatic vital signs done and the importance of sitting and standing slowly with a staff member PRN during my time of care.
5. Elevate the clients legs when in bed and encourage mobilization PRN q4hours during my time of care.
6. Ensure the client is sitting in high-fowlers if short of breath and administer oxygen per protocol PRN during my time of care.

Problem #2: Risk for electrolyte imbalance

Patient Goals:

1. Client will have normal serum electrolyte levels (potassium 3.5-5, sodium 135-145, calcium 4.5-5.6, phosphate 2.5-4.5, magnesium 3.5-5.0) during my time of care.
2. Client will have no dysrhythmias due to electrolyte imbalances during my time of care.

Assessments:

- Assess serum electrolytes (K+, Na, Ca) qshift and PRN. Assess ECG findings PRN. Assess cardiac strip for rhythm, rate, and any abnormalities q1hour and PRN. Assess for confusion, muscle spasms/cramping, respiratory distress, weakness, lethargy, palpitations PRN.

Interventions (In priority order)

1. Administer IV regular insulin as ordered during my time of care.

2. Administer sodium polystyrene sulfonate as ordered during my time of care.
3. Administer phosphate binders (Calcium acetate) as ordered during my time of care.
4. Educate on importance of potassium, sodium, and phosphate restriction and foods to avoid PRN during my time of care.
5. Ensure the client has continuous cardiac monitoring and educate on the importance of PRN during my time of care.
6. Educate client on the importance of eating a meal when taking phosphate binders PRN during my time of care.
7. Ensure client is informed that sodium polystyrene sulfonate can cause diarrhea PRN during my time of care.

At this time, complete assigned ATI Real Life Simulation

Actual Patient Problems & Goals

** The following should be completed after the ATI simulation.

Problem #1: Excess fluid volume

Patient Goals:

1. A.S. will have a urinary output of at least 30ml/hour during my time of care. Met X Unmet ☐
2. A.S. will have a normal blood pressure (120/80) and will have no edema to her lower extremities by the end of my care. Met ☐ Unmet X

Problem #2: Decreased cardiac output

Patient Goals:

1. A.S. will have a normal blood pressure (120/80), HR (60-100 BPM), and will be able to ambulate without dyspnea and weakness by the end of my care. Met ☐ Unmet X
2. A.S will be in normal sinus rhythm by the end of my care. Met X Unmet ☐

SOAP Notes Based on Priority Problems

Priority Patient Problem #1: Excess fluid volume

Subjective: *This section is your collection of the patient's complaints/concerns and/or information obtained from secondary sources.*	**Chief Complaint**: A.S. reports difficulty completing peritoneal dialysis exchanges due to having trouble with her catheter. Reports a recent weight gain of 13.2 kg over the past two days. **PMH:** Chronic kidney disease – stage V kidney failure, type 2 diabetes mellitus, hypertension Has been receiving peritoneal dialysis (APD) daily at home for nine months. AV fistula placement and peritoneal dialysis catheter placement 5/15/XX **Allergies:** NKA **Current Medications:** furosemide 20mg PO twice daily
Objective: *This section is your clinical observations. Include, pertinent vital signs, pertinent labs and diagnostics <u>related to priority problem.</u>*	**Vital Signs:** <u>2/10 1830</u> 118 HR, 24 RR, 174/94 BP, 94% RA, <u>1845</u> 96% on 2 L/min NC. <u>2/11 0055</u> 96 HR, 16 RR, 154/80, 97%. <u>1210</u> 88 HR, 18 RR, 134/76, 97% **Labs:** <u>2/10 1745</u>: RBC 3.1, Hgb 10.2, Hct 32%, potassium 6, BUN 42, Cr 8, albumin 3.2, GFR 8 <u>2/12 0400</u>: RBC 3.1, Hgb 10, Hct 30, potassium 4.7, BUN 37, Cr 6.9 **Diagnostics:** <u>2/10</u> CXR: bilateral pulmonary venous congestion <u>2/10</u> UA: cloudy, amber color, specific gravity 0.998, protein 80 (+1), blood +1, RBC >2 (8), RBC casts present, hyaline casts 13. Peritoneal dialysis evaluation – urea: 01/05 1.7, 02/05 1.4, 06/05 2.5, 10/05 2.0
Assessment: *Focused assessment on your priority problem.*	<u>2/10 Admission</u>: A.S. reports general fatigue, malaise, edema to lower extremities, decreased appetite, and shortness of breath with a non-productive cough. Oxygen saturation 94% requiring 2 L/min of oxygen. Respirations regular, tachypneic, and labored with activity. Scattered rhonchi to all fields bilaterally. Peritoneal catheter intact to abdomen and without drainage or edema. AV fistula to left forearm intact with bruit and thrill noted. Pedal pulses +3 bilaterally. 2+ pitting edema to lower extremities bilat. Urine output: at least 30ml/hour throughout hospitalization <u>2/11 0715</u>: denies dysuria and reports being able to void. Bladder non-distended. Scattered rhonchi anterior and posterior bilaterally. Respirations regular at 18/min. Continues to require 1 L/min of O2 <u>2/12 1215</u>: reports generalized fatigue, malaise, and a headache. Turgor without tenting. Bladder non-distended. Scattered rhonchi anterior fields bilaterally. Posterior fields clear. Respirations regular at 18/min. +2 pitting edema lower extremities bilaterally. Pedal pulses +3. <u>Weight</u>: admission 72.1kg, 2/11 0400 – 72.6kg, 2/11 1210 71.5kg
Plan **<u>*Based on priority problem only</u>** *Include what your plan is for the client. What treatments or medications are needed. You can include procedures, consults, labs/diagnostics, etc. What nursing interventions are being performed?*	**Plan:** <u>Hypervolemia:</u> I&O, diuresis with medication and hemodialysis <u>CKD</u>: discontinue peritoneal dialysis, begin hemodialysis, fluid restriction, monitor electrolytes. <u>Orders:</u> Vital signs q4hours. Activity – up as tolerated. Insert IV saline lock. Renal diet with 1.8 G of sodium. Strict intake and output. Fluid restriction: 1 L/day. Daily weights. Hemodialysis in the morning. Apply oxygen prn, titrate to keep sats >95%. Notify provider if SBP <100 or >180 mmHg. Furosemide 80mg IV bolus x1 then resume PO dose. 2/10 1800 Administered Furosemide 20mg PO. 2/11 0745 A.S. transported to dialysis and returned at 1200. CBC and CMP completed once A.S. returned from dialysis. 2/12 0630 discharge: continue outpatient hemodialysis 3x/week. Outpatient dietary consult (renal diet), home health services 2x/week. CBC and CMP weekly. Discharge note 2/12: stabilized following two cycles of hemodialysis. **Teaching/Resources:** Home health: educated on food choices that fit in her prescribed diet Educated on how hemodialysis may cause hypotension Educated on why furosemide IV bolus was being give Educated on what hemodialysis is and what the patient should

Priority Patient Problem #2: Decreased cardiac output

Subjective: *This section explains the client symptoms. Include a narrative of the patient's complaints/concerns and/or information obtained from secondary sources.*	**Chief Complaint:** A.S. reports difficulty completing peritoneal dialysis, reports recent weight gain of 13.2kg. Current medications: aspirin 81mg PO daily, losartan 50mg PO daily, furosemide 20mg PO 2x/daily, ferric citrate 1 gram PO 3x/day with meals, sevelamer carbonate 800mg PO 3x/day with meals
Objective: *This section is your clinical observations. Include vital signs,*	**Vital Signs:** 2/10 1830 118 HR, 24 RR, 174/94 BP, 94% RA, 1845 96% on 2 L/min NC. 2/11 0055 96 HR, 16 RR, 154/80, 97%. 1210 88 HR, 18 RR, 134/76, 97% **Labs:**

pertinent labs and diagnostics related to priority problem.	02/10 1745 RBC 3.1, Hgb 10.2, Hct 32%, sodium 132, potassium 6, calcium 8, phosphorus 7.5 02/10 2045 sodium 132, potassium 5.9, calcium 7.8, phos 7.5 2/12 0400 RBC 3.1, Hgb 10, Hct 30%, potassium 4.7, sodium 136, calcium 9, phosphorus 5.5 **Diagnostics:** 2/10 2100 telemetry: sinus tachycardia with peaked T waves at 114 BPM 2/11 1400 telemetry: NSR at 80 BPM
Assessment: *Focused assessment on your priority problem.*	Admission: reports edema to lower extremities. A.S. is lethargic, A+O x4. Tachycardia noted. S1, S2 with regular rhythm. Pedal pulses +3 bilaterally. 2+ pitting edema to lower extremities bilaterally. 2/11 0715: reports chills. A+O x4, capillary refill brisk. Apical HR regular at 94/min. Weakness with gait. 2/11 1215: A+O x4, capillary refill brisk. Apical HR regular at 88/min. +2 pitting edema lower extremities bilaterally.
Plan ***Based on priority problem only** *Include what your plan is for the client. What treatments or medications are needed. You can include procedures, consults, labs/diagnostics, etc. What nursing interventions are being performed?*	**Plan:** Hypertension: continue oral medications, monitor BP Hyperkalemia: cardiac monitoring, hemodialysis Apply telemetry monitor to provide continuous cardiac monitoring. Strict intake and output. Renal diet with 1.8 G of sodium. Vital signs q4hours. Fluid restriction: 1 L/day. Daily weights. Administer AM medications that were withheld prior to dialysis after client returns from dialysis. Notify provider of SBP <100 or >180 mmHg Obtain BMP 1 hour after administering IV furosemide. Administration of Epoetin Alfa 50units/kg 3x/week IV bolus during dialysis for Hgb <11 2/10 1800 Administered furosemide 20mg PO, ferric citrate 1 gram PO with meals, sevelamer carbonate 800mg PO with meals 2/10 2250 Administered Labetalol 20mg IV bolus x1 now 2/11 1300 Administered Aspirin 81mg PO, losartan 50mg PO 2/12 0630 discharge: discontinue cardiac monitor. Renal diet, 1800mg sodium, low potassium, low fat. Home health services 2x/week. CBC and CMP weekly **Teaching/Resources:** Educated the importance of continuous cardiac monitoring when potassium is elevated. Educated client on the reason for the frequent blood pressure checks. Educated client that hemodialysis can cause hypotension Educated client on food choices that will follow her prescribed diet.

Reflection:

1. Go back to your Preconference Template:
    a. Indicate (circle, star, highlight, etc.) the components of your preconference template that you saw applied to the care of this virtual patient.

2. What was your biggest “take-away” from participating in the care of this patient? How did this impact your nursing practice?

My biggest take-away from participating in the care of this patient is how quickly the symptoms and fluid retention can occur when dialysis wasn’t successful or completed. This scenario was beneficial for me because it showed me a scenario that I could see in the hospital and will allow me to have some experience on what to expect for the plan of care for this type of patient. This impacted my nursing practice because it showed me how hard it can be for a client that has to change their diet and it showed me how the nurse needs to take the time to discuss ways the client can still have their favorite food but also follow their ordered diet. This scenario impacted my nursing practice because it showed me symptoms that could be present for a client with hypervolemia and hyperkalemia. It was beneficial to be able to connect what was learned in theory and connect it to a clinical situation. It also impacted my nursing practice because it showed me to look at the patient as a whole instead of just the symptoms and the diagnoses.

Urinary system:

Kidneys: bean shaped, below the ribs, and in the superior lumbar region. The right kidney is lower than the left because of the liver. The adrenal glands are on top of each one. A transparent fibrous capsule encloses each kidney that prevents infections from surrounding regions to spread to the kidneys. Perirenal fat capsule surrounds each one and acts as a cushion against blows. The renal fascia is the outer layer of connective tissue that anchors the kidney and adrenal gland to the surrounding structures. The renal artery supplies blood to each kidney. Renal calyces are chambers of the kidney, they collect urine, and it drains into the renal pelvis -> ureter -> bladder. The renal calyces enclose the tips of the renal pyramids. The walls of calyces contain smooth muscle that contracts to propel urine by peristalsis.

- 3 regions: cortex, medulla, and pelvis. The renal cortex is the most superficial and has a granular appearance. The renal medulla is the next layer and it exhibits the renal pyramids. The renal columns separate the pyramids. The renal pelvis is a funnel-shaped tube that is continuous with the ureter.
- Filters, allows waste and excess ions to leave in urine while returning needed substances to the blood. Eliminates nitrogenous waste, toxins, and drugs from the body. Regulates blood volume for proper balance between water and salt and acid and bases. Regulates blood pressure (renin) and erythropoietin stimulates red blood cell production. Converts vitamin D to its active form.

- Nephrons: structural and functional units of the kidneys, blood-processing units – carry out the processes that form urine. Each nephron consist of a renal corpuscle and a renal tubule.
- Glomerulus: ball formed of small blood capillaries, allows large amounts of solute-rich + protein-free fluid to pass from the blood into the glomerular capsule – is the material that the renal tubules process to form urine.
    1. Glomerular filtration produces a cell and protein free filtrate
    2. Tubular reabsorption: process of selectively moving substances from the filtrate back into the blood. Takes place in the renal tubules and collecting ducts. It reclaims almost everything filtered. Anything that isn't reabsorbed becomes urine.
    3. Tubular secretion: process of selectively moving substances from the blood into the filtrate.
    -Filtrate: contains everything found in blood plasma except proteins. Urine contains unneeded substances such as excess salts and metabolic wastes.

Ureters: active role in urine transport. Carries urine from kidneys to bladder through contraction of smooth muscle that is pushing it downward. If it backs up or stays still -> kidney infection can develop

Bladder: smooth, collapsible, muscular sac that temporarily stores urine. Held in place by ligaments that are attached to other organs. Walls of the bladder relax and expand to store urine and contract to empty through the urethra. Is a reservoir and can hold 1.5-2 cups of urine. Apex (top), fundus (base), body (main), neck is the part that constricts. Sphincter muscles help keep urine from leaking by closing it tightly around opening of bladder. The nerves in the bladder tell the person when it's time to urinate.

Urethra: tube that allows urine to pass outside of the body .When the brain signals the bladder muscles to tighten and sphincter muscles to relax -> urination occurs.

- Internal: involuntary sphincter, keeps urethra closed when urine isn't being passed. Smooth muscle and connective tissue. External: voluntarily controlled.