*Complete and submit to the corresponding dropbox by 1600 on the assigned clinical day.

To Be Completed Before the Simulation

**** Blue boxes should be completed using textbook information. What do you expect to find? This information should be collected before you start the ATI simulation.

Medical Diagnosis/ Disease: CKD

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

Anatomy and Physiology
Normal Structures

Renal System:
-2 retroperitoneal kidneys, partially protected by ribs 11&12. The right kidney is slightly lower to accommodate the liver.
-Function: filters toxins, waste from blood (150 L per day); regulates blood pH (bicarb), volume, pressure, and osmolarity; produces vitamin D and erythropoietin (stimulates rbc production); secretes renin
-receives ¼ of total CO
-Blood flow:
heart--> renal arteries--> segmental arteries--> interlobar arteries--> arcuate arteries--> corticate radiate arteries--> afferent arterioles--> capillary beds--> efferent arterioles--> renal veins--> heart
-Nephrons, the functional units: approx 1 million per kidney. Site of blood filtering and urine formation.
-Nephron flow/urine production:
-molecules in the blood are absorbed into the renal tubules using various types of transport including active transport, osmosis, facilitated diffusion, and passive electrochemical gradients.
This is the general path from blood to urine production inside a nephron: afferent arteriole--> ~glomerulus--> ~bowman's capsule*--> ~proximal convoluted tubule--> ~descending-ascending loops of henle --> ~distal convoluted tubule--> collecting duct (not part of a nephron)--> ureter--> bladder
Key:
~ indicates transportation of

Pathophysiology of Disease

1. Initiating factor (diabetes, HTN, toxins, immune-complex formation in situ, circulating Ig deposition, ANCAs, hypoxemia, prolonged trauma, chronic dehydration/hypovolemia, fibrosis, sclerotic lesions, etc.)
2. Decreased # of nephrons
3. Activation of cytokines, vasoactive mediators, RAAS, growth factors
4. Structural and functional changes of surviving nephrons
5. Hyperfiltration
6. Increased intraglomerular capillary pressure
7. Accelerated sclerosis of remaining nephrons
8. Further decrease in # of nephrons

-Repeats this cycle until the initiating factor is resolved
-CKD is progressive because we cannot generate new nephrons.
-Nephrons do have a very limited capacity to restore some function only if they are surrounded by healthy nephrons to provide cells and microvasculature
-Dialysis and eventual kidney transplantation is the course of CKD to ESRD

NCLEX IV *(7)*: Reduction of Risk

Anticipated Diagnostics
Labs

Blood
-eGFR
-BUN
-Cr
-electrolytes, Na+, K+, Ca+
-CO2
-Hgb A1c
-troponin-t can also indicate renal disease
Urine
UA + morphology
UACR (albumin-creatinine ratio)

Additional Diagnostics

KUB
-US –CT –MRI
Renal bx*
*Gold standard dx

substances across a membrane occurs at this point *molecules to be reabsorbed into the blood will come out of bowman's capsule and into the efferent arteriole and peritubular capillaries to join the blood being returned to the heart. -Of note: exchange of Na+ and H2O occurs in the loop of henle -Gross morphology: renal hilum=indent in middle of the kidneys, access point for ureters, arteries, veins, lymphatics, nerves -Membranes: renal fascia (outer) to anchor, adipose capsule (middle) for protection, renal capsule (inner) gives shape	-CKD is defined by 4 stages: –Stages 1 & 2 have an eGFR >/=90 and 60-89, respectively, over the duration of 3 months -Stages 3 & 4 have an eGFR between 30-59 and 15-29, respectively, at any point in time -Stage 4 CKD transitions into end stage renal disease (ESRD) when eGFR<15 *eGFR measured in mL/min -CKD differs from AKI because AKI does not include nephron loss -AKI is specific to cells that can be regenerated, unlike nephrons which cannot. -Nephron loss must be present to dx CKD -nephron loss is indicated by prolonged (>/= 3 months) decreased glomerular filtration rates	

NCLEX II *(3)*: Health Promotion and Maintenance **NCLEX IV *(7)*: Reduction of Risk**

Contributing Risk Factors	**Signs and Symptoms**	**Possible Therapeutic Procedures**	**Prevention of Complications**
Hyperlipidemia, CVD, diabetes, HTN, prolonged toxin exposure-occupational etc., autoimmune disease, liver disease, prolonged hypoxemia, chronic dehydration/hypovolemia, fibrosis, sclerotic lesions, recurrent AKIs,	Gradual onset, may be nonspecific -anorexia, wt loss, fatigue -new onset/worsening htn, -abnormal fluid volume, oedema - pruritis and/or dryness -ammonia smelling urine or breath -proteinuria, hematuria -alterations in elimination patterns, urgency -chronic anemia -muscle cramps from	**Non-surgical** Fluid and electrolyte repletion Dialysis for filtration and to pull excess fluid off Nutritional counseling Albumin, Fe infusions Stem cell therapy (mostly experimental) **Surgical** Kidney transplant Radical or partial nephrectomy	(What are some potential complications associated with this disease process) Mineral-bone disease Heart disease Anemia Fluid build-up: lungs, peritoneal, extremity edema, orbital edema High potassium-arrhythmias UTIs Metabolic acidosis Hyperphosphatemia Hypocalcemia

	electrolyte imbalance		

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

Anticipated Medication Management

ACE inhibitors/ARBS 1st line tx of albuminuria and control of bp to slow progression

Calcium carbonate or calcium acetate for hyperphos and hypocalc tx

Epo to tx anemia

Digoxin, dobutamine for cardiac involvement

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

Non-Pharmacologic Care Measures

Low sodium, low CHON, low potassium, high protein diet
Low stimulation environment, energy conservation
Heat pads, epsom soaks if muscle cramps r/t/ electrolyte imbalances
Pressure injury prevention
Protein shakes if anorexia symptoms
Assistance creating calendars, schedules, paper or digital logs of dialysis appointments, nutritional intake, fluid intake, symptoms. Empower to take active role in care throughout disease progression, as able.

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

What stressors might a patient with this diagnosis be experiencing?

Chronic and progressive diagnosis—incurable
Financial
Lifestyle changes
Age when diagnosed
Psychosocial
Pain
Body image-dialysis port, av fistula scars
Acute progressions, symptomatic flare-ups
Finding a donor

Client/Family Education

List 3 potential teaching topics/areas

☐CKD, dialysis diet compliance
☐Kidney foundations, support groups
☐Stages of CKD, hemodialysis versus peritoneal

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)

Nutritionist/dietician, nephrology, urology, nursing team, hematology, rheumatologist if autoimmune, PCP, OT, PT, chaplain

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. Lungs are clear bilaterally and breath sounds are soft and breezy--posteriorly and anteriorly during time of care.

2. SBP is 100-120 mmHg and DBP is 60-80 mmHg during time of care.

Assessments:

- BP q8h, if stable; auscultate lungs qshift, prn before/after intervention; SpO2 q8h, prn; HR q8hr, prn; RR and effort q8h, prn; palpate + score extremity edema q12h; inspect periorbital oedema q12h; I&O,continuously; daily weights

Interventions (In priority order):

1. Deliver 2L O2 via NC if SpO2 is below 93% on RA and titrate per protocol prn.
2. Maintain and transport to hemo/peritoneal dialysis per provider's orders for excess fluid removal
3. Administer albumin IVP as ordered
4. Administer diuretics as ordered
5. Elevate extremities to promote venous return, continuously, as tol
6. Apply TEDS, SCDS, to promote venous return, continuously, as tol

Problem #2: Electrolyte imbalance

Patient Goals:

1. Heart rate is 60-100 bpm and regular rhythm on auscultation during time of care.

2. Serum levels are: K^+ 3.5-5.2, Na^+ 135-145, Ca^{2+} 8.6-10.3, PO_4^{3-} 2.8-4.5 during time of care.

Assessments:

- I&O, continuously; temp/hr and rhythm/bp q8h, prn; diet qshift; reflexes q shift; trousseau's + chvostek's signs prn; EKG continuous on tele; BMP daily

Interventions (In priority order):

1. Maintain low sodium, potassium diet, monitor BMP results and supplement as needed to correct imbalances
2. Maintain hemo/peritoneal dialysis appointments for extracorporeal filtration of electrolytes, as ordered.
3. Administer calcium gluconate to correct hypocalcemia and hyperphosphatemia as ordered
4. Administer positive inotrope as ordered to correct arrhythmias.
5. Administer non-potassium-sparing loop diuretics as indicated per lab values and provider orders

6. Educate on symptoms to report and expected symptoms of CKD in relation to electrolyte balances, as tol.

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. Lung sounds are clear bilaterally on posterior and anterior upper and lower lung fields after receiving 80 mg IV Lasix bolus on 2/10/xx. Met £ Unmet n
2. SBP decreased from 182 mmHg on 2/10/xx at 2240 by 20-30% following first HD treatment on 2/11/xx. Met n Unmet £

Problem #2: Electrolyte imbalance

Patient Goals:

1. Serum levels are: K^+ 3.5-5.2, Na^+ 135-145, Ca^{2+} 8.6-10.3, PO_4^{3-} 2.8-4.5 after administration of IV Lasix, calcium gluconate, HD x2 rounds during time of care. Met n Unmet £
2. Heart rate is 60-100 bpm and normal sinus regular rhythm during time of care. Met £ Unmet n

SOAP Notes Based on Priority Problems

Priority Patient Problem #1: Excess fluid volume

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: recently gained 13.2 kg and short of breath, also believes her peritoneal dialysis is not working for her anymore

PMH: CKD stage 4, DM2, HTN, uremic pruitus. Is a peritoneal dialysis patient, but also has a working AV fistula.

Allergies: NKA

Current Medications: Glizipide XL 20mg PO daily, ASA 81mg daily, losartan 50mg, furosemide 20 mg PO BID, ferric citrate 1g PO TID with meals, lipagliptin 5 mg PO, tramadol 50 mg PO q6h prn pain/discomfort, sevelamer 800 mg PO TID with meals, docusate 10o mg PO BID, tacrolimus topical, gentimicin topical, gabapentin 100 mg PO TID, atorvostatin 20mg PO daily

Per doctor's orders--Lasix 80 mg IV bolus was administered this evening, 2/10/xx.

Objective:

This section is your clinical observations. Include, pertinent vital signs, pertinent labs and diagnostics related to priority problem.

Vital Signs:

2/10/xx 1845	2/10/xx 2040	2/10/xx 2125
BP 178/96	170/84	178/96
HR 118 (1830)	116	110
RR 24 (1830), SpO2 96% 2L NC	20, SpO2 96% 2L NC	20, SpO2 96% 2L NC

Time	*1845*	*2040*	*2100*
Urine Output	-	100 mL	60 mL

Labs:

	2/10/xx 1700

	<table><tr><td>**BUN**</td><td>**42 H**</td></tr><tr><td>**Creatinine**</td><td>**8 H**</td></tr><tr><td>**eGFR**</td><td>**8 L**</td></tr><tr><td>**Na+**</td><td>**132 L**</td></tr><tr><td>**Albumin**</td><td>**3.2 L**</td></tr><tr><td>**Pre albumin**</td><td>**30 L**</td></tr><tr><td>**Total protein**</td><td>**6.1 L**</td></tr><tr><td>**UA specific gravity**</td><td>**0.998 L**</td></tr><tr><td>**UA hyaline casts (none)**</td><td>**13**</td></tr><tr><td>**UA Protein (0)**</td><td>**+1**</td></tr></table> **Diagnostics: N/A**
Assessment: *Focused assessment on your priority problem.*	**2/11/xx @0715** A&Ox4. Denies pain or discomfort. Turgor without tenting. Capillary refill brisk. Scatted rhonchi (coarse crackles) anterior and posterior fields bilaterally. Respirations regular @18/min and slightly labored. Continues to require O2 1L via NC (down from 2L 2/10/xx). AP HR 94 bpm regular. Abd soft, nondistended w/o tenderness, bladder nondistended. Denies dysuria and reports able to void (voided 160 mL after administration of Lasix last night). +2 pitting edema bilat lower extremities pedal pulses +3 bilat. AV fistula L arm intact palpable thrill and audible bruit.
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:** **Lasix bolus effective—O2 requirements via NC were decreased by 1L, voided 160 mL, respiration rate decreased to WNL, HR is WNL, absence of abd or bladder distention.** **-The presence of coarse crackles in all lung fields and +2 pitting edema in bilateral lower**

	extremities indicates that she is likely still in a hypervolemic state. The persistent elevation in blood pressure after the administration of lasix was managed with IV bolus labetalol last night which tells us that the HTN was likely a sx of both fluid overload and inability of the kidneys to regulate her bp. **-Plan to continue with the first of several HD treatments today for further management of hypervolemia.** **Teaching/Resources: "My bp may decrease during hemodialysis" High protein diet, to take the home prescription for lasix earlier in the day, rather than at night like we gave her in the hospital to avoid sleep interruptions. Resources: nutritionist, outpatient; home log/diary of I's & O's**

Priority Patient Problem #2: Electrolyte Imbalance

<table>
<tr><td><u>S</u>ubjective:

This section explains the client symptoms. Include a narrative of the patient's complaints/concerns and/or information obtained from secondary sources.</td><td>Chief Complaint:

Racing HR/ palpitations, observable weakness</td></tr>
<tr><td><u>O</u>bjective:

This section is your clinical observations. Include vital signs, pertinent labs and diagnostics <u>related to priority problem.</u></td><td>Vital Signs:

<table>
<tr><td>2/10/xx 1845</td><td>2/10/xx 2040</td><td>2/10/xx 2125</td></tr>
<tr><td>BP 178/96</td><td>170/84</td><td>178/96</td></tr>
<tr><td>HR 118 (1830)</td><td>116</td><td>110</td></tr>
<tr><td>RR 24 (1830),</td><td>20, SpO2 96%</td><td>20, SpO2 96%</td></tr>
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<tr>
<td></td>
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<table>
<tr><td>SpO2 96% 2L NC</td><td>2L NC</td><td>2L NC</td></tr>
</table>
Labs:
<table>
<tr><td></td><td>2/10/xx 1700</td><td>2/10/xx 2045</td></tr>
<tr><td>Na^+</td><td>132 L</td><td>132 L</td></tr>
<tr><td>K^+</td><td>6 H</td><td>5.9 H</td></tr>
<tr><td>$C_6H_{12}O_6$</td><td>174 H</td><td>166 H</td></tr>
<tr><td>Ca^{2+}</td><td>8 L</td><td>7.8 L</td></tr>
<tr><td>PO_4^{3-}</td><td>7.5 H</td><td>7.5 H</td></tr>
</table>
Diagnostics: EKG--Peaked T waves, widened QRS complexes
</td>
</tr>
<tr>
<td><u>A</u>ssessment:

Focused assessment on your priority problem.</td>
<td>Negative for Chvostek sign, negative Trousseau sign, no tetany, notably weak muscle strength.</td>
</tr>
<tr>
<td><u>P</u>lan
<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?</td>
<td>Plan:
-Hyperkalemia: Potassium level relatively unchanged (6 to 5.9) after administration of calcium gluconate potassium binder with regular insulin and 50% dextrose to account for susceptibility of hypoglycemia in CKD pts. Anticipate administration of meds that decrease the effect of potassium on cardiac muscle (bblockers, titratable potassium binder drip, etc.) Anticipate low potassium diet. Continue to monitor on tele.
-Hyperphosphatemia and hypocalcemia: Continue to monitor for Chvostek’s sign, Trousseau’s, manifestations of tetany. Monitor muscle strength, administer phosphate binder between meals.

Teaching/Resources: Low potassium diet, systemic manifestations of specific electrolyte imbalances: ex. Palpitations-hyperkalemia, wooziness/disorientation-hyponatremia, etc.</td>
</tr>
</table>

Student Name _____
ATI Real Life Scenario_____
10

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?

For this simulation I wanted to be as thorough as possible in my pre-conference work. When I think of CKD I think of electrolyte imbalances, but I don't typically think which electrons specifically and whether they are anticipated to be high or low. While doing the pre-work I made sure to note which way electrolytes would likely be and not only did it correlate to this simulation's patient, but they are also very similar to the imbalances I saw in my patient during my last districts. That was delightful! I think the biggest takeaway though is the importance of following up on labs and assessments after any intervention you perform as a nurse. It was very interesting to see the patient's bp response after they were diuresed with Lasix. Despite the effectiveness seen in her voiding 160 mL, her bp remained elevated which is fun because it makes us do more thinking and investigating. Also, the potassium levels that remained elevated after Lasix and calcium gluconate were fun because I got to google about other interventions that can be done until the patient can get dialysis.

Time Allocation: 8 hours