Medications

Allopurinol (Zyloprim) 100mg tablet by mouth, daily
Pharmacological class: Xanthine oxidase inhibitor (Jones & Bartlett Learning, 2023).
Therapeutic class: Antigout (Jones & Bartlett Learning, 2023).
Reason for taking: Due to her acute kidney injury she likely has a buildup of waste products like uric acid. She may also have undiagnosed gout (Jones & Bartlett Learning, 2023).
Key nursing assessments: Obtain a baseline CBC and uric acid level, review the results of renal and liver function tests before and during this drug therapy, and maintain a fluid intake for the patient to produce 2L of daily urine output (Jones & Bartlett Learning, 2023).

Apixaban (Eliquis) 2.5mg tablet by mouth, twice a day
Pharmacological class: Factor Xa inhibitor (Jones & Bartlett Learning, 2023).
Therapeutic class: Anticoagulant (Jones & Bartlett Learning, 2023).
Reason for taking: To help reduce the risk of stroke or any systemic embolism for patients with atrial fibrillation, which this patient has a history of (Jones & Bartlett Learning, 2023).
Key nursing assessments: Monitor the patient closely for signs of bleeding (Jones & Bartlett Learning, 2023).

Atorvastatin (Lipitor) 40mg tablet by mouth, daily
Pharmacological class: HMG-CoA reductase inhibitor (Jones & Bartlett Learning, 2023).
Therapeutic class: Antihyperlipidemic (Jones & Bartlett Learning, 2023).
Reason for taking: this patient has a history of high cholesterol and this drug will help to control lipid levels and reduce the risk of a stroke or heart attack in patients with type II diabetes with hypertension (Jones & Bartlett Learning, 2023).
Key nursing assessments: Expect liver function tests to be done prior to starting this medication and expect to measure lipid levels 2-4 weeks after starting the medication. Also be sure to monitor diabetic patients blood glucose levels because this drug can affect it (Jones & Bartlett Learning, 2023).

Budesonide-formoterol fumarate 160-4.5 MCG/ACT inhaler (Entocort EC), 2 puffs oral inhalation twice a day
Pharmacological class: Corticosteroid (Jones & Bartlett Learning, 2023).
Therapeutic class: Antiasthmatic, anti-inflammatory (Jones & Bartlett Learning, 2023).
Reason for taking: This patient has a history of asthma and this medication is used to provide maintenance and prophylactic treatment for asthma (Jones & Bartlett Learning, 2023).
Key nursing assessments: Expect to prime the oral inhaler before using it for the first time. Monitor patients with diabetes, hypertension, osteoporosis, and peptic ulcer disease as this drug can increase adverse effects and be sure to remind the patient to rinse their mouth out with water after every use of the inhaler (Jones & Bartlett Learning, 2023).

Calcitriol (Rocaltrol) 0.25mg capsule by mouth, daily
Pharmacological class: Vitamin D analogue (Jones & Bartlett Learning, 2023).
Therapeutic class: Antihypocalcemic (Jones & Bartlett Learning, 2023).
Reason for taking: This patient has arthritis and this drug helps to increase calcium absorption which helps improve bone and joint health (Jones & Bartlett Learning, 2023).
Key nursing assessments: Be sure that the patient consumes enough calcium and warn them not to take other forms of vitamin D while also taking calcitriol. Monitor the patient closely for vitamin D toxicity (Jones & Bartlett Learning, 2023).

Empagliflozin (Jardiance) 10mg tablet by mouth, daily
Pharmacological class: Sodium glucose cotransporter 2 inhibitor (Jones & Bartlett Learning, 2023).
Therapeutic class: Antidiabetic (Jones & Bartlett Learning, 2023).
Reason for taking: To help improve glycemic control for her type II diabetes (Jones & Bartlett Learning, 2023).
Key nursing assessments: Ensure the patient is well hydrated and administer in the morning. Frequently assess the patient's fluid volume status because this drug can cause intravascular volume contraction and this can lead to hypotension and acute kidney injury (Jones & Bartlett Learning, 2023).

Ezetimibe (Zetia) 10mg tablet by mouth, daily
Pharmacological class: Cholesterol absorption inhibitor (Jones & Bartlett Learning, 2023).
Therapeutic class: Antilipemic (Jones & Bartlett Learning, 2023).
Reason for taking: This is being taken in combination with her atorvastatin to help reduce her cholesterol (Jones & Bartlett Learning, 2023).
Key nursing assessments: Monitor liver enzymes before and during ezetimibe therapy as the physician orders (Jones & Bartlett Learning, 2023).

Insulin glargine 100 unit/ML, 20 units subcutaneous injection, nightly
Pharmacological class: Synthetic human insulin (Cunningham & Freeman, 2023).
Therapeutic class: Antidiabetic (Cunningham & Freeman, 2023).
Reason for taking: This is a long-acting insulin to help control her type II diabetes (Cunningham & Freeman, 2023).
Key nursing assessments: Obtain and monitor patients' blood glucose for correct dosage (Cunningham & Freeman, 2023).

Insulin lispro (Humalog) 100 unit/ML, 2-12 units, subcutaneous injection 3 times a day after meals
Pharmacological class: Human insulin analog (Islam et al., 2023).
Therapeutic class: Antidiabetic (Islam et al., 2023).
Reason for taking: This is a fast-acting insulin to help control her type II diabetes (Islam et al., 2023).
Key nursing assessments: Obtain and monitor patients' blood glucose for correct dosage (Islam et al., 2023).

Insulin lispro (Humalog) 100 unit/ML, 2-6 units, subcutaneous injection nightly
Pharmacological class: Human insulin analog (Islam et al., 2023).
Therapeutic class: Antidiabetic (Islam et al., 2023).
Reason for taking: This is a fast-acting insulin to help control her type II diabetes (Islam et al., 2023).
Key nursing assessments: Obtain and monitor patients' blood glucose for correct dosage (Islam et al., 2023).

Lisinopril (Prinivil) 40mg tablet by mouth, daily
Pharmacological class: Angiotensin-converting enzyme (ACE) inhibitor (Jones & Bartlett Learning, 2023).
Therapeutic class: Antihypertensive (Jones & Bartlett Learning, 2023).
Reason for taking: To treat her hypertension (Jones & Bartlett Learning, 2023).
Key nursing assessments: Monitor blood pressure prior to administration. Monitor patients' fluid volume and use cautiously with patients with fluid volume deficit or impaired renal function (Jones & Bartlett Learning, 2023).

Metoprolol succinate (Toprol-XL) 100mg tablet by mouth, daily
Pharmacological class: Beta-adrenergic blocker (Jones & Bartlett Learning, 2023).
Therapeutic class: Antianginal, antihypertensive (Jones & Bartlett Learning, 2023).
Reason for taking: This is being used in conjunction with lisinopril to manage her hypertension (Jones & Bartlett Learning, 2023).
Key nursing assessments: Monitor blood pressure and blood glucose of patients with diabetes. Assess ECG (Jones & Bartlett Learning, 2023).

Pregabalin (Lyrica) 75mg capsule by mouth twice a day
Pharmacological class: Antiepileptic (Cross et al., 2022).
Therapeutic class: Analgesic (Cross et al., 2022).
Reason for taking: This medication helps to treat the pain she has associated with her history of neuropathy and diabetes (Cross et al., 2022).
Key nursing assessments: This drug may increase thoughts of suicide so changes in mood and behavior should be monitored closely (Cross et al., 2022).

Vitamin b-12 (Cobalamin) tablets 500mcg by mouth, daily
Pharmacological class: Tetrapyrrolic corrin ring (Amin & Gupta, 2023).
Therapeutic class: N/A
Reason for taking: This patient is taking vitamin b12 as a dietary supplement to help improve renal function (Amin & Gupta, 2023).
Key nursing assessments: Obtain CBC, serum vitamin b12, folate, and iron levels and monitor potassium levels (Amin & Gupta, 2023).

Demographic Data

Date of Admission: 2/3/2024
Admission Diagnosis/Chief Complaint: The patient arrived at the ER with concerns of head pain after falling and hitting the back of her head on her bedframe. Upon admission, she was diagnosed with an acute kidney injury. Secondary diagnoses include congestive heart failure exacerbation, hyperglycemia, and generalized weakness.
Age: 81 years old
Gender: Female
Race/Ethnicity: Caucasian
Allergies: Codeine – vomiting
Ibuprofen – unknown reaction
Code Status: DNR
Height in cm: 162.6cm
Weight in kg: 101.4kg
Psychosocial Developmental Stage: Ego Integrity vs. Despair
Cognitive Developmental Stage: Formal Operational Stage
Braden Score: 18
Morse Fall Score: 72
Infection Control Precautions: Standard Precautions

Admission History

Patient, MG is an 81-year-old female that arrived at the ER at 06:38 on 2/3/2024 with severe head pain. She stated that she was trying to get back into bed after using the bathroom, "missed the edge of the bed" and then hit the back of her head on her bedframe. Upon admission to the hospital to examine her head, she was diagnosed with an acute kidney injury. The patient described the location of the majority of her symptoms to be isolated to the back of her head and upper neck due to her fall, but she also stated that her "whole body felt tired." When questioned further, the patient said that she had been feeling very fatigued "constantly" for the whole week prior to her fall, so much so that she was mostly staying in bed all day. She describes her pain now as 8/10, constant, dull, and throbbing in the back of her head and still feels "overall weak". Associated manifestations to the fatigue include the patient stating because she was feeling so tired, she stopped taking her medications and hardly had any appetite. "Sleeping and Motrin" made her feel a little better, but she could not tolerate much more activity than occasionally getting up to use the bathroom. The patient admits to having had some other minor falls in the past, but never needing medical attention for them. She also denies ever having received treatment for a kidney injury in the past.

Medical History

Previous Medical History: Arthritis, Asthma, Bursitis of the right shoulder, Chronic idiopathic constipation, Type 2 Diabetes, Hypertension, High cholesterol, Neuropathy, Pure hyperglyceridemia, Atrial fibrillation, Primary osteoarthritis of the left knee, and Long-term anticoagulant use.

Prior Hospitalizations: 11/13/2023 for rapid atrial fibrillation, 10/16/2023 for rapid atrial fibrillation, 7/5/2023 for atrial fibrillation, 3/4/2023 for dizziness.

Previous Surgical History: Hysterectomy, Rotator Cuff Repair (Left), Colonoscopy, Total Knee Arthroplasty (Right & Left), Pacemaker Insertion, Cardiac Catheterization Cardioversion (Bilateral).

Social History: Patient reports to have quit smoking 44 years ago. She reports to have smoked only cigarettes. She denies smokeless tobacco use, alcohol use, and recreational drug use.

Lab Values/Diagnostics

Venous CO2 (22-30mmol/L): **20** – due to being in a more acidic state from her kidney injury (Pagana et al., 2023).

BUN (10-20mg/dL): **50** – due to her acute kidney resulting in poor renal function. It could also be an indicator that she is dehydrated (Pagana et al., 2023).

Creatinine (0.6-1.0mg/dL): **2.05** – due to her acute kidney resulting in poor renal function (Pagana et al., 2023).

GFR (>= 60): **24** – due to poor filtration through the kidneys due to her kidney injury (Pagana et al., 2023).

BUN/Creatinine Ratio (12-20): **24** – due to poor kidney function from her kidney injury (Pagana et al., 2023).

Glucose (70-99mg/dL): **159** – due to hyperglycemia from type II diabetes. It could also be due to an acute stress response from hitting her head (Pagana et al., 2023).

Bedside Glucose (70-99mg/dL): **195** – due to hyperglycemia from type II diabetes. It could also be due to an acute stress response from hitting her head (Pagana et al., 2023).

CT head or brain without contrast: done due to this patient falling and hitting her head. Results showed moderate to severe atrophy, but no acute intracranial hemorrhage or extra axial fluid collection. There was not acute infarct either.

Chest X-ray: This test was ordered for this patient due to her history of hypertension, high cholesterol, and secondary diagnosis of congestive heart failure exacerbation. The results of the x-ray showed mild pulmonary and vascular congestion along with cardiomegaly and calcification of the aortic arch. All of these things are consistent with congestive heart failure.

Pathophysiology

Disease process: An acute kidney injury (AKI) occurs when something harmful abruptly hurts the kidneys and very quickly reduces their ability to properly function (Capriotti, 2020). There are many things that can cause an acute kidney injury, but the most common cause is a lack of blood flow to the kidneys and this significantly decreases the kidney's glomerular filtration rate (Capriotti, 2020). Without proper blood flow, the glomeruli in the kidneys cannot properly filter waste products from the body and this leads to a buildup of nitrogenous waste products and it also can greatly disrupt fluid and electrolyte balances in the body (Capriotti, 2020). AKI will also result in an increased serum creatinine and BUN because, again, the glomeruli cannot properly filter the blood and create urine. Oftentimes, hypovolemia and dehydration are causes of decreased blood flow to the kidneys (Capriotti, 2020). Other causes of AKI can be from damage to the actual tissues of the kidney due to infections, trauma, or some medications like NSAIDs (Capriotti, 2020). Or AKI can be caused when there is an obstruction to urine leaving the body such as from an enlarged prostate or strictures and this causes a back up to the kidneys and again impedes proper filtration (Capriotti, 2020). In the case of this patient, it is likely that she developed an AKI due to poor blood flow from dehydration. She had stated that she was so tired that she had not felt like getting out of bed the last week and had no appetite. Without proper fluid intake she quickly decreased the blood flow getting to her kidneys. She also stated to have been taking Motrin, which is an NSAID, that could have contributed to her AKI. She also stopped taking her home medications and by not properly managing her hypertension and diabetes, this could have affected blood flow to the kidneys as well.

S/S of disease: Signs and symptoms of an AKI include having very little urine output and fluid overload such as facial swelling and peripheral edema (Capriotti, 2020). A person with an AKI may also feel fatigued, nauseous, have little appetite, and be confused (Capriotti, 2020). A person with AKI can also have hyperkalemia, thrombocytopenia, anemia, and be in metabolic acidosis (Capriotti, 2020). BUN and creatinine lab results will also be elevated, indicating poor kidney function. Considering this patient specifically, she felt extremely fatigued and stated to only get up to use the bathroom every once in a while, which may indicate little urine output. She also had very little appetite, her venous CO2 suggests she may have some metabolic acidosis, and her BUN and creatinine labs were elevated as well, which shows decreased kidney function.

Method of Diagnosis: To diagnose an AKI a urinalysis should be done and a BMP lab with serum electrolytes, serum creatinine, and BUN should also be done (Capriotti, 2020). The provider will also want to have an arterial blood gas lab and a CBC to get a more complete picture of the AKI (Capriotti, 2020). Radiographic imaging might also be utilized to look for any obstructions to the kidneys or changes in kidney size (Capriotti, 2020). In some cases, a renal biopsy may also be performed to understand what is causing an intrarenal cause of AKI (Capriotti, 2020). For this patient, she had a urinalysis done, had a BMP, serum electrolytes, serum creatinine, BUN, and GFR labs done, and also had ABGs and a CBC to diagnose her AKI. She did not have any imaging.

Treatment of disease: Treating an AKI is based upon what actually caused the injury. If it was a lack of blood flow that caused the AKI then fluids are administered to treat them (Capriotti, 2020). If it was some sort of infection for example then antibiotics would also be given (Capriotti, 2020). If the patient is not able to produce enough urine, then diuretics may also be prescribed (Capriotti, 2020). Patient's electrolyte levels are also monitored closely and those with potassium imbalances receive cardiac monitoring (Capriotti, 2020). In more severe cases of AKI where symptoms do not resolve quickly then hemodialysis may be needed (Capriotti, 2020). This patient was given fluids, allopurinol 100mg tablets daily to reduce uric acid build up and was placed on cardiac monitoring.

Active Orders

-Consistent carbohydrate (CHO), low calorie, renal diet due to acute kidney injury.

-BMP with calcium and CBC labs drawn to monitor electrolyte balances and any signs of bleeding or infection.

-OT and PT evaluation and treatment due to her generalized weakness.

-Routine assessment for respiratory treatment plan and oxygen therapy via nasal cannula due to her history of asthma and being in bed so much recently.

-Admission and daily weights to monitor fluid status.

-Insert and maintain a peripheral IV for fluids and due to heart monitoring.

-Monitor intake and output due to impaired kidney functioning.

-Perform POC blood glucose before meals and at night and provide insulin as needed due to type II diabetes.

-Telemetry monitoring due to congestive heart failure.

-Have patient up as tolerated and ambulate to prevent atrophy.

-Vital signs per floor routine due to need for patient observation.

Physical Exam/Assessment

General: The patient was alert and oriented to person, place, time, and situation at time of assessment. She appeared to be in some acute distress due to pain at the back of her head, she was grimacing when adjusting in bed. She is well-groomed but looks fatigued.

Integument: Skin color was appropriate for ethnicity. Skin was warm and dry and skin turgor showed mild tenting likely due to dehydration related to her AKI. There were no rashes, or lesions, but there was some bruising on the left arm from her IV site and mild bruising on her bottom as a result of her fall. Normal quantity, distribution, and texture of hair for gender. Nails were without clubbing or cyanosis and capillary refill was less than 3 seconds for fingers and toes bilaterally.

HEENT: Head and neck are symmetrical and the trachea is midline without deviation. Carotid pulses were both 2+ bilaterally and there was no sign of jugular vein distention or lymphadenopathy in the head or neck. There was no visible bruising to her head or neck from her recent fall. **Eyes**: white sclera bilaterally, bilateral corneas clear, and bilateral pink, moist, conjunctiva with no visible drainage from eyes. Pupils were equal, round, and reactive to light and accommodation bilaterally. EOMs intact bilaterally. Patient wears glasses. **Ears:** there were no visible or palpable deformities, lumps, or lesions on the ears and hearing is intact. **Nose:** the septum is midline, the turbinates are moist and pink bilaterally and there is no visible bleeding or polyps. Bilateral frontal sinuses are nontender to palpation. **Mouth:** Oral mucosa is pink, moist, and intact. The tongue and uvula are midline. Hard palate is intact. Patient is missing a few teeth, but states that she does not use dentures. Quality of speech is still good.

Cardiovascular: S1 and S2 sounds were clear at all locations with an overall regular rate and rhythm. No signs of murmurs, gallops, or rubs and no S3 or S4 sounds present. The apical pulse was palpable at the 5th intercostal space and left midclavicular line. The client is on telemetry monitoring and has a pacemaker. Client's peripheral pulses were even and 2+ throughout bilaterally, except for her dorsalis pedis bilaterally were 1+. Capillary refill was also less than 3 seconds bilaterally in fingers and toes. There were no signs of edema.

Respiratory: Normal rate and pattern of respirations. The respirations are symmetrical and breathing is non-labored. Lung sounds appeared slightly diminished in the bases but no wheezes, crackles, or rhonchi noted.

Genitourinary: Patient is continent and able to use the bathroom without assistance. Patient stated to have urinated once this morning and that the urine was dark yellow which is likely related to poor kidney function from her AKI.

Gastrointestinal: The patient states to eat a regular diet at home but is currently on a CHO consistent low-calorie diet due to her AKI. She also states to still not have much of an appetite. Last bowel movement was yesterday (2/4/24) soft and formed. There are no lesions, bruising, rashes, or scars present on the abdomen. No signs of abdominal distension. The abdomen is soft and non-tender with no masses or organomegaly upon palpation. Bowel sounds were hypoactive in all four quadrants.

Musculoskeletal: All extremities have full range of motion. Hand grips were strong and equal bilaterally. Pedal pushes and pulls were slightly diminished 4/5 bilaterally. She is easily able to follow commands. The patient currently has generalized weakness due to her AKI. The patient also states to use a walker at home and has some difficulty getting out of bed. She is currently a one person assist with ambulation.

Neurological: The patient's LOC at the time of assessment is awake and fully alert. She is orientated to person, place, time, and situation. Normal cognition and developmental level for age upon assessment. Strength is equal bilaterally and she can move her upper extremities well and can also move her lower extremities, just slightly slower. No signs of facial asymmetry and PERRLA is intact. The patient does experience neuropathy at times related to her type II diabetes.

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

2/5/2024 at 11:12

Temperature: 97.1℉

Respirations: 18 bmp

Pulse: 83 bmp

Blood pressure: 111/63

O2 saturation: 97% on room air

Pain and pain scale used: Patient rates her pain an 8 out of 10 on the numeric rating scale. The pain is concentrated at the back of her head from her fall and is described as constant and throbbing.

Nursing Diagnosis 1	Nursing Diagnosis 2	Nursing Diagnosis 3
Acute pain related to physical injury to the head as evidenced by grimacing with movement, patient verbally expressing a throbbing pain in the back of her head, and rating the pain 8/10 (Phelps, 2023).	Deficient fluid volume related to insufficient fluid intake as evidenced by client stating they are still fatigued, poor skin turgor, dark urine reported, and elevated BUN and creatinine labs (Phelps, 2023).	Impaired physical mobility related to fatigue and decreased lower extremity strength as evidenced by the patient being too tired to get out of bed, needing to use a walker, and also experiencing falls in the past (Phelps, 2023).
Rationale This diagnosis was chosen and highly prioritized because the patient was obviously in a great deal of pain from falling and hitting her head. She would grimace to re-adjust herself in bed and she was also sensitive to sounds and light. This patient was also very anxious about her pain. A pain rating of 8/10 is considered severe and acute pain can cause other complications such as increased heart rate, respirations, and BP. If not addressed, uncontrolled pain can lead to delayed healing times and difficulty performing ADLs as well.	**Rationale** This diagnosis was chosen because the patient had stated that she was still feeling very tired and did not want to order breakfast in the morning. This means that she is probably still not taking in enough fluids due to being too tired and this could exacerbate her acute kidney injury. Upon assessment it was also noticed that she had some tenting in her skin turgor and she said that when she did use the bathroom that morning that her urine was dark yellow. This in combination with the fact that her BUN and creatinine labs were elevated all suggests dehydration and fluid volume deficit. If her fluid volume is not increased then she will continue to lack blood flow to her kidneys causing further injury and complications.	**Rationale** This diagnosis was chosen because due to the patient feeling so tired, she was and still is having difficulty getting out of bed. Upon assessment it was also found that she had mildly decreased lower extremity strength as well (4/5, bilaterally). The patient also mentioned that she needs to use a walker at home to get around and that she has fallen a few times in the past. This shows that she has difficulty getting around safely as well. The fatigue that is keeping her in bed and resulting in impaired physical mobility also puts her at risk for further complications such as muscle atrophy, pneumonia, and pressure injuries, and another AKI.
Interventions **Intervention 1:** Promptly administer pain medication according to provider orders and routinely monitor and reassess for effectiveness (Phelps, 2023). **Intervention 2:** Provide comfort measures to the client to promote relaxation such as ambient lighting, warm blankets, pillows, distractions, and breathing techniques (Phelps, 2023).	**Interventions** **Intervention 1:** Provide plenty of fluids and educate and remind the patient to maintain adequate fluid intake (Phelps, 2023). **Intervention 2:** Measure and record daily weights at the same time every day as an indicator of fluid status (Phelps, 2023).	**Interventions** **Intervention 1:** Monitor and record daily any evidence of immobility complications such as skin breakdown, venous stasis, and urinary tract infections (Phelps, 2023). **Intervention 2:** Encourage participation in physical therapy sessions and support those activities (Phelps, 2023).
Evaluation of Interventions The patient was compliant with the pain management regime and tolerated interventions well. 1 hour after administration of the pain medication her pain level was reassessed and still	**Evaluation of Interventions** The patient was regularly given fresh water and offered other drinks such as juice to encourage her to drink more fluids. The patient was receptive to the teaching and stated that	**Evaluation of Interventions** The patient tolerated inspections for skin breakdown fairly well. She expressed some discomfort in having to roll from side to side so that her skin could be properly examined. There

found to be an 8/10 with very little relief. Therefore, the provider was spoken to about adjusting her pain medication regime. The patient was also provided with comfort measures such as adjusting the lighting of her room, providing an extra pillow, a new warm blanket, and her door was kept closed to keep out extra noise. She expressed thanks for adjusting her environment and stated to be more comfortable. It appears that the comfort measures are helpful, but that the current pain management regime needs to be adjusted further.	she would attempt to drink more fluids. By the afternoon she had drunk a cup of water and a small apple juice. The importance of daily weights was also explained to her and she was compliant with the intervention stating that she preferred to be weighed in the morning.	were no new signs of skin break down. By the end of the shift the patient showed no evidence of immobility complications. The patient was also receptive to physical therapy. She expressed interest in seeing the physical therapist and after some reminding, got herself moving more with some assistance to go sit in her chair for a bit. Overall, it appears that the patient understands the importance of moving throughout the day.

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