

Case Study 1

Scenarios

A nurse from the float pool is working today on the renal inpatient unit. Each of the following situations refers to patients she is caring for.

The nurse receives report that she is to admit a patient from the emergency department with “severe renal colic.” How would the patient describe this pain and what medical and nursing interventions are necessary?

The patient would report severe spasmodic pain as his body attempts to pass a kidney stone. Medical and nursing interventions would include:

- Strain urine to capture stone for analysis.
- Pain management using opioids and comfort measures.
- Increase fluid intake and monitor urine output.
- Stone removal if it is not passed spontaneously.
- Dietary changes and medications to reduce the risk of future stone formation.

The patient admitted with a diagnosis of a renal stone has been identified as having a calcium oxalate stone. The patient asks what foods cause these stones to occur and the nurse states they are associated with intake of which foods?

Dark green leafy vegetables and caffeine

The nurse is assessing the patency of a Mr. Stein’s left arm arteriovenous fistula after he returns from his dialysis treatment. Which finding indicates the fistula is patent and able to be used?

Auscultation (bruit) and/or palpation (thrill) of blood rushing through the fistula.

Mr. Stein, has chronic renal failure and needs protein. Which type of protein would be the least harmful to the kidneys?

High-quality protein that is low in phosphorous, such as lean meats (turkey, chicken), cottage cheese, egg whites, fish, and protein supplements like Ensure®

Mr. Stein has had a GI x-ray ordered. What drug would be likely to increase his risk for acute respiratory failure if given as a GI prep and why?

Sodium phosphate laxatives (e.g., Fleets®). Phosphate is normally absorbed by the GI tract and excreted by the kidneys. In chronic renal failure, the ingestion of excessive phosphates leads to hyperphosphatemia. As a result, calcium is deposited in tissues, causing hypocalcemia and tetany, and leading to acute respiratory failure.

Case Study 2

Scenario: Diuretic

Mrs. Dewey, 76 years old, has a history of cardiovascular disease including hypertension and heart failure. She had been receiving furosemide and developed mild hypokalemia for which a potassium supplement was prescribed. How does furosemide work?

Furosemide is a loop diuretic that acts in the ascending loop of Henle to inhibit sodium and chloride reabsorption. This leads to decreased interstitial hypertonicity, reduced water reabsorption, and increased urine output.

What mechanisms of action of furosemide would cause Mrs. Dewey to become hypokalemic?

Furosemide also increases urinary potassium excretion by enhancing distal tubular potassium secretion and reducing potassium reabsorption in the loop of Henle.

What assessments, then, would the nurse find necessary to make?

Muscle strength, bowel sounds, respirations, EKG (flat, ST segment, Q waves)

Mrs. Dewey was also instructed to increase her dietary intake of potassium. What foods would the nurse suggest she eat?

Dried fruit, bananas, orange juice

The hypokalemia continued and Mrs. Dewey was switched to spironolactone. How is this drug different from furosemide?

Spironolactone is a potassium-sparing diuretic that promotes the excretion of sodium, chloride, and carbonate but blocks potassium excretion by inhibiting aldosterone.

Mrs. Dewey arrives at the health provider’s office. During the assessment, she reveals she has been experiencing nausea, abdominal cramping, and diarrhea along with some muscle cramps, weakness, and a feeling that “her heart was going to jump out of her chest.” What might be occurring now?

The patient is displaying signs of hyperkalemia.

What might have caused the hyperkalemia?

Potential causes of the hyperkalemia include:

- Renal insufficiency reducing the excretion of potassium.
- Increased dietary intake of potassium.
- Too high dosage of spironolactone for elderly patient.

What would need to be included in the teaching plan for Mrs. Dewey?

Avoid potassium-rich foods; signs and symptoms of hyperkalemia to report to physician.