

Practice Exam Questions

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Nephrology Nursing Certification Commission

CDN

Certified Dialysis Nurse



EXAMAIDES

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Total Question: 175 QAs

Section Description: Parker Case Questions (Q1~Q9)

James Parker is a 48-year-old patient who has been receiving hemodialysis treatments 3 times weekly for the past 6 months.

Question No: 1

Mr. Parker routinely experiences hypotensive episodes near the end of a session with malaise, muscle cramps, and dizziness after dialysis. What is the most likely cause?

- A. The dry weight is set too low.
- B. The dry weight is set too high.
- C. The patient is having an allergic reaction to dialysate.
- D. The patient is exhibiting signs of hypokalemia.

Answer: A

Explanation: If a hemodialysis patient routinely experiences hypotensive episodes near the end of a session with malaise, muscle cramps, and dizziness after dialysis, the most likely cause is that the dry weight is set too low. If these symptoms occur, then the patient's dry weight may need to be adjusted. If the dry weight (the optimal post-dialysis weight) is set too high, the patient may experience fluid overload after dialysis, resulting in peripheral edema and/or pulmonary edema with subsequent ingestion of fluids.

Question No: 2

Generally, the optimal dialysate flow rate for hemodialysis should be

- A. equal to the blood flow rate.
- B. 1.5 to 2 times the blood flow rate.
- C. 2 to 2.5 times the blood flow rate.
- D. 2.5 to 3 times the blood flow rate.

Answer: B

Explanation: Generally, the optimal dialysate flow rate should be 1.5 to 2 times the blood flow rate. The standard dialysate flow rate is 500 mL/min, but this may be increased to 800 mL/min for select patients; studies indicate little benefit above 600 mL/min. Increasing the time of dialysis rather than the dialysate flow rate may confer more benefit. The dialysis dose is affected by numerous other factors, such as the dialyzer's mass transfer area coefficient.

Question No: 3

According to the KDOQI, the minimum target (as opposed to delivered) spKt/V dose for patients receiving hemodialysis 3 times weekly is

- A. 0.8.
- B. 1
- C. 1.2
- D. 1.4

Answer: D

Explanation: According to the National Kidney Foundation Kidney Disease Outcomes Quality Initiative (NKF KDOQI) guidelines, the minimum target spKt/V (single pool Kt/V) dose for patients receiving hemodialysis is 1.4 because the minimum dose for the patient is 1.2, but because there is a coefficient of variation among

patients of 0.1 Kt/V units, the target dose is slightly higher to ensure the dose does not fall below 1.2. K refers to the dialyzer clearance of urea, t refers to the time/ duration of dialysis, and V refers to the volume of body fluid (urea clearance area); the spKt/V is used to determine the adequacy of dialysis.

Question No: 4

According to KDOQI guidelines, the dialysis dose for patients on hemodialysis should be monitored at least

- A. 1 time weekly.
- B. every 2 weeks.
- C. 1 time monthly.
- D. every 2 months.

Answer: C

Explanation: According to KDOQI guidelines, the dialysis dose for patients on hemodialysis should be monitored at least once monthly, sampling both pre-dialysis and post-dialysis BUNs. The blood samples for the BUNs should be collected at the same session. These values are then used to calculate the urea reduction ratio (URR) and spKt/V. To ensure accuracy, the proper sampling techniques must be followed carefully. Some variation in results is common, so averaging 3 monthly spKt/V values is often done before adjusting the dialysis prescription.

Question No: 5

If Mr. Parker is receiving hemodialysis with a dialyzer with an ultrafiltration coefficient (KuF) of 10 and a transmembrane pressure (TMP) of 100 mm Hg, how much fluid should the patient lose per hour of treatment?

- A. 100 mL.
- B. 500 mL.
- C. 1000 mL.
- D. 1500 mL.

Answer: C

Explanation: If the patient is receiving hemodialysis with a dialyzer with an ultrafiltration coefficient (KuF) of 10 and a transmembrane pressure (TMP) of 100 mm Hg, the patient should lose 1000 mL of fluid per hour of treatment. Transmembrane pressure refers to the average difference in pressure from the blood side of the membrane to the dialysate side (blood side minus dialysate side pressure). The ultrafiltration coefficient (KuF) (mL/ h/mm Hg) is multiplied by the TMP:

- $10 \text{ (mL/ h/mm Hg)} \times 100 \text{ (mm Hg)} = 1000 \text{ mL/ h}$

Question No: 6

If Mr. Parker has a dialyzer clearance rate of 250 mL/ min with 4 -hour treatment, the total volume of blood cleared is

- A. 6 L.
- B. 60 L.
- C. 6000 mL
- D. 600 L.

Answer: B

Explanation: If a hemodialysis patient has a dialyzer clearance rate of 250 mL/min with a 4-hour (240- minute) treatment, the total volume of blood cleared is 60 L:

- $250 \text{ mL} \times 240 \text{ min} = 60,000 \text{ mL or } 60 \text{ L.}$

This clearance rate is used to calculate the Kt/V dose. The V refers to the total volume of fluid in the body, usually about 60% by weight; if a patient weighs 70 kg, the volume of water in the body is $70 \times 0.6 = 42$ L

- $Kt = 250 \times 240 = 60$ L
- $V = 70 \times 0.6 = 42$.
- $Kt/V = 60/42 = 1.4$

Question No: 7

Mr. Parker must have a postdialysis BUN. When drawing a postdialysis blood sample for BUN, one method is to slow the blood flow rate to

- A. 200 mL/ min for 30 seconds.
- B. 100 mL/ min for 15 seconds.
- C. 100 mL/ min for 3 minutes.
- D. 200 mL/ min for 3 minutes.

Answer: B

Explanation: When drawing a post-dialysis blood sample for BUN, one method is to slow the blood flow rate to 100 mL/ min for 15 seconds before sampling because this duration of time is sufficient for unrecirculated blood to reach below the sampling port. As an alternative, the dialysate flow can be stopped for 3 minutes (or decreased to the minimum level if the equipment does not allow stopping the flow). This period of time is generally sufficient to stabilize the dialysate outlet BUN level with the blood inlet BUN level.

Question No: 8

Mr. Parker must also have a number of other routine blood tests, including serum ferritin.

The target for serum ferritin for patients on hemodialysis is

- A. <100 ng/mL.
- B. $\$100$ ng/mL.
- C. <200 ng/mL
- D. $\$200$ ng/mL.

Answer: C

Explanation: The target for serum ferritin for patients on hemodialysis is ~ 200 ng/mL. Adults with normal kidney function usually are not diagnosed with iron deficiency anemia if their serum ferritin level is > 15 ng/mL. However, the targets are higher with patients with chronic kidney disease because the inflammation associated with kidney disease increases the level of serum ferritin, so ~ 100 ng/mL is recommended as the target for patients with chronic kidney disease and ~ 200 ng/mL for patients on hemodialysis.

Question No: 9

Because Mr. Parker is a patient on hemodialysis, he must have a monthly albumin level tested. The target value for a patient on hemodialysis is

- A. >2.5 g/dL.
- B. >3.5 g/dL.
- C. >4 g/dL.
- D. >5 g/dL.

Answer: C

Explanation: Albumin is a protein that is critically important for fluid balance in the body and is a measure of nutritional status in patients with grade 5 kidney failure (ESKD). Low serum albumin levels increase the risk of

mortality, especially if the level falls below 3.5 g/dL. While albumin levels may vary (the value is generally between 3.6 and 5 g/dL), patients on hemodialysis should maintain serum albumin levels >4 g/dL to ensure levels do not fall below the safety margin.

Section Description: Bell Case Questions (Q10~Q16)

Mary Bell is a 56-year-old woman scheduled for a kidney transplant because of autosomal dominant polycystic kidney disease. For the previous 4 years, the patient has been treated with hemodialysis.

Question No: 10

Ms. Bell's partner has volunteered to be a living donor. The first concern when evaluating the donor is

- A. general health.
- B. insurance coverage.
- C. age and sex.
- D. psychological status.

Answer: D

Explanation: If the partner of a patient with ESKD has volunteered as a living donor, the first concern when evaluating the donor is the person's psychological status. If the patient does not pass this assessment, further assessment is unnecessary. When a family member or partner is involved, it is very important to ascertain if there is a history of domestic abuse or circumstances that suggest coercion. The potential donor should be assessed for a history of psychiatric or psychological disorders as well as a history of substance abuse.

Question No: 11

Which of the following information gleaned during a psychiatric consultation is most likely to be a contraindication for kidney transplant?

- A. History of depression.
- B. History of nonadherence to treatment regimen.
- C. History of substance abuse.
- D. History of unemployment.

Answer: B

Explanation: The information gleaned during a psychiatric consultation that is most likely to be a contraindication for kidney transplant is a history of nonadherence to treatment regimen. If the patient was unable to adhere to treatment during kidney failure, the patient is likely to encounter problems after transplantation, when following the treatment regimen is critical. Many patients have a history of psychiatric disorders, but this alone is not a contraindication, nor is a history of substance abuse. Many patients have a history of unemployment because of having to cope with a chronic illness.

Question No: 12

Following kidney transplantation, IV fluids are administered for maintenance and replacement of lost fluids. How much insensible loss is anticipated per hour?

- A. 10 mL.
- B. 30 mL.
- C. 45 mL.
- D. 60 mL.

Answer: B

Explanation: Following kidney transplantation, fluids must be administered for both maintenance and

replacement. Insensible loss is approximately 30 mL/ h and is usually replaced with dextrose 5% in water, while other fluid losses, such as from urinary output and NG drainage, are commonly replaced with one-half normal saline. IV fluids are used to help control urinary output; if urinary output is low, the patient may be administered a bolus of 0.5 to 1 L of normal saline. Electrolytes are generally provided, if needed, in a separate infusion.

Question No: 13

In the immediate postoperative period after kidney transplantation, the physician should be notified if urinary output is

- A. <50 mL for 1 hour.
- B. >500 mL for 1 hour.
- C. > 150 mL/h for 4 hours
- D. <60 mL/h for 2 consecutive hours.

Answer: D

Explanation: In the immediate postoperative period after kidney transplantation, the physician should be notified if urinary output is less than 60 mL/ h for 2 consecutive hours, more than 300 mL/ h for 4 hours, or more than 500 mL/ h for 2 consecutive hours. Urinary output must be carefully monitored to assess kidney function and to determine the amount of replacement IV fluids required.

Question No: 14

Ms. Bell exhibit signs of kidney rejection 6 hours after transplantation. Kidney rejection within hours of transplantation is classified as ...

- A. accelerated.
- B. hyperacute.
- C. chronic.
- D. acute.

Answer: B

Explanation: Kidney rejection within hours of transplantation is classified as hyperacute. Types of rejection include:

- Hyperacute: This can occur within a few minutes or hours of transplantation and results from anti-donor antibodies and complement system activation.
- Accelerated: This may occur within days of transplantation and involves reactivation of sensitized T cells.
- Acute: This may occur within days up to a number of weeks and involves primary activation of T cells.
- Chronic: This form develops over a period of months to years and involves multiple factors, both immunologic and nonimmunologic.

Question No: 15

Ms. Bell receives immunosuppressive agents to reduce risk of rejection. Which of the following immunosuppressive agents utilized to prevent kidney rejection after transplantation is the most nephrotoxic?

- A. Cyclosporine.
- B. Azathioprine.
- C. Tacrolimus.
- D. Mycophenolate mofetil.

Answer: A

Explanation: Cyclosporine, an immunosuppressive agent used to prevent kidney rejection after transplantation, can be especially nephrotoxic, so kidney function must be monitored carefully during administration. Nephrotoxicity increases with a number of drug-drug interactions (such as with NSAIDs, ranitidine, and many antibiotics), so patients should be advised to always consult with the physician before taking any medications, including OTC. Patients should also avoid St. John's wort, alfalfa sprouts, and grapefruit.

Question No: 16

When Ms. Bell is discharged after kidney transplantation, the nurse should ensure the patient understands that the primary measures to determine the health of the kidney are

- A. serum creatinine and urinary output.
- B. BUN and urinary output.
- C. BUN and serum creatinine.
- D. urinary output and blood pressure.

Answer: A

Explanation: When a patient is discharged after kidney transplantation, the nurse should ensure the patient understands that the primary measures to determine the health of the kidney are serum creatinine and urinary output. Patients should keep a log of urinary output and should be aware of their serum creatinine levels, so that if patients see local physicians who are less familiar with kidney transplants, the patients can alert the physicians to levels of concern. Any increase of 25% or more in the serum creatinine requires immediate assessment of kidney function.

Section Description: Woods Case Questions (Q17~Q21)

Tamara Woods is a 61-year-old woman who is critically ill and has developed acute kidney injury (AKI).

Question No: 17

The most common cause of acute kidney injury in the critically ill is

- A. older age.
- B. heart failure.
- C. pneumonia.
- D. sepsis.

Answer: D

Explanation: The most common cause of acute kidney injury (AKI) in critically ill patients, especially elderly patients, is sepsis because sepsis results in hemodynamic instability and hypoperfusion. Therefore, the first-line treatment is fluid resuscitation with intravenous fluids; however, because of increased vascular permeability resulting from inflammation, the fluid may move into the interstitial (third) space. Vasopressors are often used to combat hypotension, but they may also increase vascular resistance in the kidney microvasculature.

Question No: 18

Ms. Woods has increasing peripheral edema and pulmonary congestion with decreased urinary output. The medication of choice is likely

- A. thiazide diuretic.
- B. osmotic diuretic.
- C. loop diuretic.
- D. potassium-sparing diuretic.

Answer: C

Explanation: If a patient with acute renal failure has increasing peripheral edema and pulmonary congestion with decreased urinary output, the medication of choice is likely a loop diuretic, such as furosemide. Studies indicate that loop diuretics do not improve outcomes for patients who are severely ill with AKI; however, the diuretics increase urinary output and may relieve edema and pulmonary congestion in patients with heart failure, so they are frequently prescribed.

Question No: 19

Ms. Wood's ECG telemetry shows peaked T waves and widening of the QRS interval.

These changes may be indicative of

- A. hyperkalemia.
- B. hypokalemia.
- C. hypernatremia.
- D. hyponatremia.

Answer: A

Explanation: In a patient with AKI, if ECG telemetry shows peaked T waves and widening of the QRS interval, signs that may lead to ventricular tachycardia or fibrillation, these changes may be indicative of hyperkalemia. Other indications of hyperkalemia (>4.5 mEq/L) are irritability, anxiety, nausea and vomiting, weakness, abdominal cramping, and numbness and tingling of the fingertips and around the mouth. With AKI, levels may increase to ≥ 6 mEq/L in a short period of time.

Question No: 20

Ms. Woods becomes anuric despite treatment, and her potassium level rapidly increases from 4.5 to 6. The most likely temporary emergent treatment is

- A. loop diuretic.
- B. insulin and glucose.
- C. sodium polystyrene sulfonate.
- D. intravenous normal saline.

Answer: B

Explanation: If a patient with AKI and anuria has a potassium level that has increased from 4.5 to 6 mmol/L in a short time, the most likely temporary emergent treatment is insulin (10 units regular) and glucose (50 mL of dextrose 50% solution) per infusion as this causes the potassium to move from the serum and into the cells. Diuretics may be given to decrease potassium but only if the patient is producing adequate urine. Sodium polystyrene sulfonate (Kayexalate) or dialysis may be used as permanent methods to reduce potassium levels.

Question No: 21

If Ms. Woods' serum creatinine increases from 0.75 to 1.5 mg/dL, what effect on the GFR does the nurse expect?

- A. Increase 50%.
- B. Decrease 50%.
- C. Increase 25%.
- D. Decrease 25%.

Answer: B

Explanation: In a patient with acute kidney injury, if the serum creatinine (a byproduct of muscle metabolism)

increases from 0.75 to 1.5 mg/dL, the nurse expects that the GFR will decrease by 50%. Normal creatinine ranges from 0.5 to 1.2 mg/dL (45 to 107 micromole/L). The potential critical value is greater than 7.4 mg/dL in nondialytic patients. Chronic renal insufficiency occurs with creatinine of 1.5 to 3 mg/dL with renal failure present at greater than 3 mg/dL.

Section Description: Rule Case Questions (Q22~Q24)

James Rule is a 70-year-old male patient who developed hemolytic uremic syndrome (HUS) as the result of an Escherichia coli (O157:H7) infection.

Question No: 22

HUS is characterized by the triad of (1) acute renal failure, (2) microangiopathic hemolytic anemia, and (3)

- A. thrombocytosis.
- B. thrombocytopenia.
- C. leukocytosis.
- D. leukopenia.

Answer: B

Explanation: Hemolytic uremic syndrome (HUS), a complication of E. coli (O157:H7) infection, is characterized by the triad of (1) acute renal failure, (2) microangiopathic hemolytic anemia, and (3) thrombocytopenia. HUS is most common in children younger than 5 years or older adults. Bacterial toxins from the E.coli enter the bloodstream from the intestines, causing damage to small vessels in the kidneys and sometimes other organs as well. Urinary output decreases as the diarrhea progresses.

Question No: 23

Initial therapy for HUS usually includes

- A. broad-spectrum antibiotics.
- B. antidiarrheal agents.
- C. antiplatelet agents.
- D. intravenous fluids.

Answer: D

Explanation: Initial therapy for HUS usually includes intravenous fluids to maintain fluid and electrolyte balance. Antibiotics should generally be avoided because they may stimulate the release of extra toxin; however, antibiotics may be necessary if the patient develops sepsis. Antimotility agents increase the risk that the E. coli infection will progress to HUS and they should be avoided as well.

Plasmapheresis may be used to remove antibodies from the blood. ACE inhibitors may help prevent permanent kidney damage.

Question No: 24

With HUS, the part of the kidney that is damaged is the

- A. glomeruli.
- B. loops of Henle.
- C. distal tubules.
- D. papillae.

Answer: A

Explanation: With HUS, the part of the kidney that is damaged is the glomeruli. Toxins destroy platelets, and clotting time increases. Red blood cells fragment when they flow through areas of thrombi. The glomeruli are

damaged when they become obstructed with damaged platelets and red blood cells, interfering with the kidneys' ability to filter waste products. About half of the patients with HUS progress to acute kidney failure and some may require ongoing dialysis or kidney transplant. About a third of those who develop kidney failure have delayed abnormalities of kidney function later in life.

Section Description: Kim Case Questions (Q25~Q26)

May Kim, a 58-year-old patient with type 2 diabetes and end-stage kidney disease (ESKD), has been treated with continuous ambulatory peritoneal dialysis (CAPD) for 2 years. The patient has developed numerous very painful firm brown nodules on both lower legs with some of the nodules eroding and become necrotic. The skin color appears mottled, and the patient has decreased sensation.

Question No: 25

The most likely cause of these symptoms is

- A. calcific uremic arteriolopathy (CUA).
- B. peripheral arterial disease (PAD).
- C. peripheral venous insufficiency.
- D. Staphylococcus aureus infection.

Answer: A

Explanation: If a 58-year old patient with type 2 diabetes and ESKD has been treated with CAPD for 2 years and develops numerous painful firm brown nodules on both lower legs with some nodules eroding and becoming necrotic, as well as mottled skin and decreased sensation, the most likely cause is calcific uremic arteriolopathy (CUA). CUA is a life-threatening disorder associated with kidney failure in which arterioles become calcified and result in necrosis of the tissue. It is more common in patients with diabetic comorbidity, and incidence is higher in females than males.

Question No: 26

Based on these symptoms, the most likely intervention is

- A. corticosteroids.
- B. immunosuppressive agents.
- C. IV antibiotics.
- D. IV or IP sodium thiosulfate.

Answer: D

Explanation: The treatment that is most commonly used to treat CUA is IV or intraperitoneal (IP) sodium thiosulfate. Biopsies carry a high risk of mortality but may help to guide treatment. Surgical debridement is contraindicated. Corticosteroids and immunosuppressive agents may worsen the condition. Some studies have indicated that patients on PD seem to be at higher risk of CUA than those on HD, perhaps because phosphate levels tend to be higher with PD. Secondary hyperparathyroidism is also an increased risk factor because of resultant hyperphosphatemia.

Section Description: Anders Case Questions (Q27~Q32)

Marian Anders, a 72-year-old woman with type 2 diabetes mellitus, has chronic kidney disease.

Question No: 27

A patient with diabetes mellitus and chronic kidney disease should generally have a target HbA1c of

- A. <5%.
- B. <6%.

C. <7%.

D. <8%.

Answer: C

Explanation: A patient with diabetes mellitus (either type 1 or type 2) and chronic kidney disease should generally have a target HbA1c of less than 7%, but the A1c may be individualized for the patient with type 2 diabetes. Additionally, KDOQI guidelines suggest that the target may need to be adjusted upward for patients who tend to be hypoglycemic or have multiple comorbidities. Good glycemic control can slow progression of kidney disease.

Question No: 28

In a diabetic patient with chronic kidney disease, glycosuria

A. is a good estimation of hyperglycemia.

B. is unreliable as an estimation of hyperglycemia.

C. may occur without hyperglycemia.

D. is almost always absent.

Answer: B

Explanation: In a diabetic patient with chronic kidney failure, glycosuria is unreliable as an estimation of hyperglycemia because the damaged nephrons may be inconsistent in excreting excess glucose.

Normally, urine does not contain glucose; however, if there is an excess load of glucose, it may not all be reabsorbed. With normal kidney function, glycosuria usually occurs when serum glucose levels are greater than 180 mg/ dL, but with kidney failure, this may vary widely.

Question No: 29

As chronic kidney disease progresses, which endocrinologic change can result in higher risk of fractures?

A. Hyperparathyroidism.

B. Hypoparathyroidism.

C. Hypothyroidism.

D. Hyperthyroidism.

Answer: A

Explanation: As chronic kidney disease progresses, the endocrinologic change that can result in higher risk of fractures is hyperparathyroidism. As kidney function declines, less vitamin D is converted to its active form, so less calcium is absorbed, resulting in hypocalcemia. As a compensatory measure, the parathyroid gland secretes increased amounts of parathyroid hormone (PTH) to stimulate demineralization and release increased amounts of the calcium and phosphate from the bones, resulting in weakened bony matrix.

Question No: 30

Mrs. Anders' hemoglobin is 11 g/ d. According to KDIGO guide lines, treatment for chronic kidney disease with an erythropoiesis -stimulating agent should not be initiated until the hemoglobin level falls to

A. <9 g/dL.

B. <10 g/ dL.

C. <11 g/ dL.

D. <12 g/ dL.

Answer: B

Explanation: According to KDIGO guidelines, treatment with an erythropoiesis-stimulating agent (ESA) for

anemia associated with chronic kidney disease should not be initiated until the hemoglobin level falls to less than 10 g/dL. Anemia tends to worsen as the kidneys fail, resulting in anemia because of deficiency of erythropoietin or iron; however, using an ESA to increase the hemoglobin level to 13 g/dL shows no benefit and may increase risk of complications. It also has no effect on the progression of kidney disease, so only partial correction is generally done.

Question No: 31

Ms. Anders must have dialysis or transplantation in order to survive when kidney function falls below

- A. 30% to 40%.
- B. 20% to 30%.
- C. 15% to 20%.
- D. 10% to 15%

Answer: D

Explanation: A patient with chronic kidney disease must have dialysis or transplantation in order to survive when kidney function falls below 10% to 15%, the indication for ESKD (stage 5 kidney failure). Prior to this, CKD may be managed with some combination of fluid restriction, dietary sodium restriction, and medications (such as ARBs, phosphate binders, and diuretics), although the patient's quality of life may gradually deteriorate as the GFR falls because of increasing physical limitations and complications.

Question No: 32

Dialysis will likely begin when Ms. Anders has a GFR (MDRD equation) of

- A. $<15 \text{ mL/ min/1.732}$.
- B. $<20 \text{ mL/ min/1.732}$.
- C. $<25 \text{ mL/ min/1.732}$.
- D. $<30 \text{ mL/ min/1.732}$.

Answer: A

Explanation: Dialysis is usually started when a patient with uremia has a GFR (MORD equation) of $<15 \text{ mL/ min/1.73 m}^2$. Stages of chronic kidney disease are as follows:

1. GRF remains relatively normal ($\geq 90 \text{ mL/ min/ 1.73 m}^2$)
2. GFR decreasing ($60 \text{ to } 89 \text{ mL/ min/ 1.73 m}^2$) with mild kidney damage and focus on assessing progression
3. GFR further decreases ($30 \text{ to } 59 \text{ mL/ min/ 1.73 m}^2$) with moderate kidney damage and focus on evaluating and treating complications
4. GFR decreases ($15 \text{ to } 29 \text{ mL/ min/ 1.73 m}^2$) with severe kidney damage and focus on preparing for dialysis
5. Kidney failure with GRF $<15 \text{ mL/ min/ 1.73 m}^2$ and a candidate for dialysis and/ or kidney transplant

Section Description: Aiken Case Questions (Q33~Q39)

Drake Aiken, an 18-year-old male patient with ESKD resulting from IgA nephropathy, is to begin using CAPD to control his condition.

Question No: 33

When assisting a surgeon with stencil-based preoperative mapping for insertion of a peritoneal dialysis catheter, the nurse should initially position Mr. Aiken ...

- A. in any convenient position.
- B. standing.
- C. sitting.

D. supine.

Answer: D

Explanation: When assisting a surgeon with stencil-based preoperative mapping for insertion of a peritoneal dialysis catheter, the patient should be initially positioned supine so that the abdomen can be easily visualized and the stencil placed in various positions that are appropriate for different catheters and the exit sites marked with a marking pen. Then, the patient is assisted to sitting and standing positions so that the surgeon can evaluate the exit sites in relation to skin folds, creases, and the belt line. When an exit site is selected, the mapping is completed.

Question No: 34

Prior to surgical placement of a catheter for peritoneal dialysis, the recommended antibiotic prophylaxis is generally

A. a cephalosporin (first generation).

B. vancomycin.

C. a sulfonamide.

D. an aminoglycoside.

Answer: A

Explanation: Prior to surgical placement of a catheter for peritoneal dialysis, the recommended antibiotic prophylaxis is generally a first-generation cephalosporin. Vancomycin is also frequently used, but the issue of antibiotic resistance should be considered carefully and balanced against benefits of vancomycin. Usually 1 dose of antibiotic is given at the time of the catheter insertion. A double-cuff catheter is recommended because of lower rates of infection and other site complications.

Question No: 35

After a catheter is implanted, a culture of the catheter exit site is positive for *Staphylococcus aureus* but there is no erythema or purulent discharge. The most likely cause of the positive culture is

A. peritonitis.

B. lab error.

C. colonization.

D. specimen contamination.

Answer: C

Explanation: If a culture of the catheter exit site is positive for *Staphylococcus aureus* but there is no erythema or purulent discharge, the most likely cause of the positive culture is colonization, which frequently occurs within a short time after insertion of the catheter. Colonization is a form of contamination that can lead to more serious infections because colonized bacteria are more resistant to antibiotics. Erythema, by itself, is not always indicative of an infection while purulent discharge is.

Question No: 36

Mr. Aiken receives instruction from the nurse about self-care and managing CAPD in the home environment. Which of the following is an acceptable method of warming dialysate for peritoneal dialysis in the home?

A. Immerse in warm water.

B. Apply a heating pad.

C. Leave at room temperature for 3 hours.

D. Hold under running warm water.

Answer: B

Explanation: While not used in a hospital environment, a heating pad may be used to warm dialysate solution in the home environment. Maintaining a stable temperature can be difficult and warming may take a prolonged period of time. The heating pad should have an automatic shut-off time to prevent overheating (usually about 2 hours). With this method of heating, it is especially important to check the temperature of the solution prior to instillation. Other methods used include warming cabinets and microwave ovens (not recommended but frequently used).

Question No: 37

Once a dialysate bag is heated, the temperature can be assessed by

- A. holding the bag against the wrist.
- B. folding the bag over and enclosing an electronic thermometer.
- C. inserting a thermometer into the tubing.
- D. laying an electronic thermometer on top of the bag.

Answer: B

Explanation: Once a dialysate bag is heated, the temperature can be assessed by folding the bag over and enclosing an electronic thermometer. The temperature of the dialysate should be at body temperature (37 °C) because instilling room temperature dialysate may result in chills and lowering of the body temperature. The bag should be rotated to mix the solution thoroughly before measuring temperature in case hot spots are present, especially if the dialysate was heated in a microwave oven.

Question No: 38

With CAPO, the number of exchanges that Mr. Aiken should expect to carry out in 24 hours is usually

- A. 2 to 3.
- B. 3 to 4.
- C. 4 to 5.
- D. 5 to 6.

Answer: C

Explanation: With CAPO, the number of exchanges in 24 hours is usually 4 to 5 with 3 to 4 done during the daytime hours (every 4 to 6 hours) and 1 longer exchange done during the night. During the daytime, drainage usually takes about 20 minutes. The dwell time during the night is extended to 8 to 10 hours to allow the patient to sleep. The dextrose concentration of the overnight dwell may be higher than that used during the day because of the longer duration.

Question No: 39

With CAPO, the volume of dialysate retained in the peritoneal cavity at all times in adults, such as Mr. Aiken, is usually approximately

- A. ≤ 0.5 L.
- B. ≤ 1 L.
- C. ≤ 2 L.
- D. ≤ 3 L.

Answer: C

Explanation: With CAPO, the volume of dialysate retained in the peritoneal cavity (dwell) at all times in adults is usually approximately ≤ 2 L. Exchanges are usually carried out every 3 to 4 hours during the day. The

dialysate is instilled in about 10 minutes, during which the patient may sit, stand, or lie down. After instillation, the catheter is clamped until the prescribed dwell time is completed and then drained.

Section Description: Maddox Case Questions (Q40~Q43)

Jane Maddox is a 52-year-old woman who has started on hemodialysis after both kidneys were removed because of bilateral renal cell carcinoma.

Question No: 40

When teaching Ms. Maddox to manage fluid balance, the nurse advises the patient that a 1 kg (2.2 lb) increase in weight in 24 hours is approximately equivalent to fluid retention of

- A. 0.5 L.
- B. 1 L.
- C. 1.5 L.
- D. 2 L.

Answer: B

Explanation: When teaching a patient with kidney failure and hemodialysis to manage fluid balance, the nurse advises the patient that a 1 kg (2.2 lb) increase in weight in 24 hours is approximately equivalent to fluid retention of 1 L. Patients should be advised to monitor intake and output and take daily weights. Patients' "dry" weight should be estimated every 3 to 6 weeks in order to help to estimate weight gain related to fluids. Weight gained between dialysis treatments should not exceed 5% of the dry weight estimate.

Question No: 41

Ms. Maddox has been advised to avoid foods high in phosphorus. Foods that she should be advised to limit include

- A. dairy products.
- B. vegetables.
- C. fruits.
- D. grains.

Answer: A

Explanation: If a patient on hemodialysis has been advised to avoid foods high in phosphorus, foods that should be limited include dairy products. Other foods and beverages that are high in phosphorus include beer, ale, colas, chocolate, high-protein meats (liver, organ meats), oysters, sardines, dried beans and peas, nuts, seeds, whole grains, and wheat germ and bran. Normal phosphorus level is 2.5 to 4.5 mg/dL. Lowering phosphorus levels helps to increase absorption of calcium.

Question No: 42

Ms. Maddox has been prescribed sevelamer hydrochloride as a phosphate binder. The patient should be advised to take this medication

- A. 1 hour before meals.
- B. 2 hours after meals.
- C. first thing in the morning.
- D. with meals.

Answer: D

Explanation: If a patient on hemodialysis has been prescribed sevelamer hydrochloride as a phosphate binder, the patient should be advised to take this medication with meals. Because sevelamer hydrochloride may bind