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Question: 670

A patient's hemodialysis session is interrupted due to a dialyzer reaction (Type A), with symptoms of dyspnea and hypotension within 10 minutes of starting. The technician stops the treatment and notifies the nurse. Which documentation element is critical to support incident analysis and process improvement?

- A. The patient's dietary intake for the day
- B. The patient's pre-dialysis potassium level
- C. The dialysate conductivity settings
- D. The dialyzer type, reaction symptoms, and treatment interruption time

Answer: D

Explanation: A Type A dialyzer reaction is a serious incident requiring documentation of the dialyzer type, symptoms (dyspnea, hypotension), and treatment interruption time. This supports incident analysis and process improvement by identifying potential issues with dialyzer compatibility. Dietary intake, dialysate conductivity, or potassium levels are not directly relevant to the reaction.

Question: 671

A dialysis machine's dialysate temperature is set to 37°C, but the actual temperature is 38.2°C during treatment. The temperature sensor was calibrated one week ago, and the dialysate flow rate is 500 mL/min. What is the most likely cause?

- A. High ambient room temperature
- B. Incorrect dialysate concentrate
- C. Miscalibrated flow sensor
- D. Faulty temperature control module

Answer: D

Explanation: A temperature overshoot suggests a faulty control module, which regulates heating. Incorrect concentrate affects conductivity, not temperature, a miscalibrated flow sensor impacts flow, and ambient temperature has minimal effect on modern machines.

Question: 672

A technician is precepting a new hire on emergency procedures during dialysis. The patient experiences a

seizure, and the machine alarms for “blood leak” (absorbance 0.5, normal <0.2). What is the safest sequence of actions?

- A. Administer lorazepam, stop the pump, clamp lines, disconnect
- B. Stop the pump, clamp lines, disconnect, notify the nurse
- C. Reset the alarm, administer saline, continue dialysis
- D. Clamp lines, disconnect, increase dialysate flow

Answer: B

Explanation: A seizure and blood leak alarm indicate a medical emergency and potential membrane rupture. Per CMS and AAMI protocols, the technician should stop the pump, clamp lines, disconnect the patient, and notify the nurse for seizure management. Administering medications, resetting the alarm, or increasing flow is outside the technician’s scope and risks harm.

Question: 673

During a dialysis session, a 55-year-old patient with a new arteriovenous fistula (AVF) expresses concern about maintaining their access site post-discharge. The physician’s orders include keeping the site clean and avoiding heavy lifting. Which instruction best reinforces proper AVF care to prevent complications like infection or thrombosis?

- A. Wash the site with alcohol-based sanitizer daily and lift no more than 10 pounds with the access arm.
- B. Use antiseptic wipes weekly and avoid any physical activity with the access arm to prevent thrombosis.
- C. Clean the site with soap and water daily, avoid lifting over 5 pounds, and check for a thrill regularly.
- D. Apply antibiotic ointment to the site daily and restrict arm movement to maintain fistula patency.

Answer: C

Explanation: Proper AVF care includes daily cleaning with soap and water to prevent infection, avoiding lifting heavy objects (typically over 5 pounds) to reduce pressure on the fistula, and regularly checking for a thrill (vibration indicating blood flow) to ensure patency. Alcohol-based sanitizers, antibiotic ointments, or weekly cleaning are not recommended, as they may irritate the site or be insufficient to prevent infection.

Question: 674

A 59-year-old male patient with ESRD undergoes hemodialysis. Post-treatment, the technician notes a blood pressure of 106/64 mmHg, a drop from 142/84 mmHg pre-treatment. The patient reports nausea and has a URR of 63%. The technician documents these findings. What is the most appropriate action for the technician to take?

- A. Report the symptoms and URR to the nurse

- B. Document the findings and discharge the patient
- C. Administer a 200 mL saline bolus
- D. Increase the dialysate temperature for the next session

Answer: A

Explanation: The patient's hypotension (106/64 mmHg), nausea, and low URR (63%, below the target of $\geq 65\%$) indicate intradialytic hypotension and inadequate dialysis. These findings require reporting to the nurse for further evaluation of dialysis adequacy and management of symptoms. Administering saline or adjusting dialysate temperature is beyond the technician's scope, and discharging the patient is unsafe.

Question: 675

You are reviewing the water treatment system's bacterial culture log. The latest result shows 55 CFU/mL in the product water, exceeding the AAMI RD52:2008 action level of 50 CFU/mL. The system was sanitized 1 week ago, and the endotoxin level is 0.4 EU/mL (< 0.5 EU/mL). No follow-up culture was performed. What is the most critical action?

- A. Sanitize the system again and document results
- B. Perform a bacterial culture test immediately
- C. Update the log to reflect the sanitization
- D. Increase the frequency of endotoxin testing

Answer: B

Explanation: A bacterial count of 55 CFU/mL exceeds the AAMI RD52:2008 action level, requiring immediate follow-up to ensure patient safety. Performing a culture verifies the system's status post-sanitization. Sanitizing again without testing is premature, updating the log doesn't address the issue, and endotoxin testing is unrelated to bacterial counts.

Question: 676

A 49-year-old male patient with ESRD is undergoing a 4-hour hemodialysis session. His pre-dialysis weight is 89 kg, and his dry weight is 85 kg. The prescription includes 4.2 liters of fluid removal, including 0.2 liters for rinseback, with an UF rate of 1050 mL/h. At the 2.5-hour mark, the patient develops nausea and a blood pressure of 92/50 mmHg. The TMP is stable at 210 mmHg. What is the most appropriate fluid management adjustment?

- A. Stop UF and monitor for 30 minutes
- B. Increase UF rate to 1200 mL/h
- C. Reduce UF rate to 700 mL/h and administer 250 mL normal saline
- D. Switch to sequential ultrafiltration

Answer: C

Explanation: Nausea and hypotension indicate hypovolemia from rapid ultrafiltration (1050 mL/h). Reducing the UF rate to 700 mL/h and administering 250 mL saline will mitigate hypovolemia. Increasing the UF rate would worsen symptoms. Stopping UF or switching to sequential ultrafiltration is not ideal as the patient still requires fluid and solute removal.

Question: 677

A 47-year-old patient with ARF from contrast-induced nephropathy has a creatinine of 4.8 mg/dL and urine output of 200 mL/day. Hemodialysis is initiated. When educating the patient, what should you explain as the primary difference between ARF and ESRD treatment goals?

- A. ARF focuses on long-term dialysis dependence
- B. ARF aims for kidney function recovery
- C. ARF requires higher Kt/V values
- D. ARF uses lower dialysate flow rates

Answer: B

Explanation: ARF treatment with hemodialysis aims to support the patient until kidney function recovers, as in contrast-induced nephropathy, which is often reversible. ESRD treatment focuses on long-term dialysis or transplantation due to irreversible damage. Kt/V and dialysate flow rates are similar for both conditions.

Question: 678

While performing quality control on a dialyzer reprocessing system, you notice that the total organic carbon (TOC) level in the reuse water is 0.8 mg/L, exceeding the AAMI RD61:2006 limit of 0.5 mg/L. The reprocessing system uses a reverse osmosis unit followed by a deionization (DI) polishing bed. The RO system's rejection rate is 98%, and the DI bed was last regenerated 3 months ago. What is the most appropriate corrective action to align with AAMI standards?

- A. Increase the frequency of DI bed regeneration to monthly
- B. Replace the RO membrane to improve TOC rejection
- C. Bypass the DI bed and rely solely on the RO system
- D. Recalibrate the TOC analyzer and retest the water

Answer: D

Explanation: A TOC level of 0.8 mg/L in reuse water exceeds the AAMI RD61:2006 limit, potentially indicating organic contamination that could affect dialyzer safety. Before assuming system failure, the TOC analyzer must be verified for accuracy, as calibration drift can produce false readings. Recalibrating and retesting is the first step. If the elevated TOC persists, further investigation (e.g., checking DI bed exhaustion or RO membrane integrity) is needed. Replacing the RO membrane or bypassing the DI bed

without confirmation is premature, and increasing DI regeneration frequency may not address the root cause.

Question: 679

The dialysis unit is setting objectives to improve medication safety. A recent incident involved administering heparin from a vial labeled 10,000 units/mL instead of 1,000 units/mL, resulting in a patient receiving a 10-fold overdose. The vials were stored adjacent to each other. What is the most effective storage-related objective?

- A. Implement barcoding for all medication vials
- B. Store heparin vials of different concentrations in separate locked cabinets
- C. Train staff to verify vial labels before administration
- D. Use pre-filled heparin syringes instead of vials

Answer: B

Explanation: Storing different concentrations of heparin in separate locked cabinets physically prevents mix-ups, addressing the storage-related error directly. This objective enhances safety by reducing reliance on staff vigilance.

Question: 680

You are setting up a dialysis machine for a patient with a prescribed dialysate sodium of 138 mmol/L and potassium of 2 mmol/L. The acid concentrate contains 4 mmol/L potassium, and the machine's proportioning ratio is 1:34 (acid:dialysate). To achieve the prescribed potassium level, you calculate the required adjustment using the formula: $\text{Final [K+]} = (\text{Acid [K+]} \times \text{Acid Proportion}) + \text{Bicarbonate Contribution}$. Assuming negligible potassium in the bicarbonate solution, what adjustment is needed to meet the prescription?

- A. Dilute the acid concentrate to reduce potassium to 2 mmol/L
- B. No adjustment needed; the prescription is met
- C. Adjust the proportioning ratio to 1:35
- D. Use a potassium-free acid concentrate

Answer: D

Explanation: Using the formula, $\text{Final [K+]} = (4 \text{ mmol/L} \times 1/34) + 0 \approx 0.118 \text{ mmol/L}$, which is far below the prescribed 2 mmol/L. The acid concentrate's potassium contribution is insufficient, and no bicarbonate contribution is assumed. To achieve 2 mmol/L, a potassium-free acid concentrate must be used, allowing precise addition of potassium via a separate solution to meet the prescription. Diluting the concentrate or adjusting the proportioning ratio would not accurately achieve the target, and the current setup does not meet the prescription.

Question: 681

During dialysis termination, you notice that the dialyzer has significant clotting (30% of fibers occluded) in a 55-year-old female patient with an AV fistula. The patient's heparin dose was 2000 units bolus and 800 units/hour infusion. The venous pressure was 270 mmHg during the last 30 minutes. What is the most appropriate action to address dialyzer efficiency for the next session?

- A. Recommend a thrombolytic agent to clear the dialyzer fibers.
- B. Switch to a low-flux dialyzer to reduce clotting risk.
- C. Inspect the dialysis circuit for kinks and adjust the venous pressure alarm.
- D. Increase the heparin bolus to 3000 units and maintain the infusion rate.

Answer: D

Explanation: Significant clotting and high venous pressure suggest inadequate anticoagulation, reducing dialyzer efficiency. Increasing the heparin bolus to 3000 units enhances anticoagulation to prevent clotting. Low-flux dialyzers are less efficient, circuit kinks are not confirmed, and thrombolytics are not used for dialyzer clotting.

Question: 682

You are tasked with maintaining equipment storage in the dialysis unit. A new shipment of dialysis catheters arrives, labeled for storage at 15–25°C (59–77°F) and <60% relative humidity. The storage room's monitor shows a current temperature of 28°C (82°F) and 70% humidity. What is the most appropriate action to ensure compliance with quality standards?

- A. Move the catheters to a temporary refrigerated storage unit
- B. Adjust the room's air conditioning to meet storage requirements
- C. Open the catheter packages to allow air circulation
- D. Use the catheters within 48 hours to avoid degradation

Answer: B

Explanation: The storage conditions exceed the manufacturer's specifications, which could compromise catheter integrity. Adjusting the room's air conditioning to maintain 15–25°C and <60% humidity ensures proper storage, preserving equipment quality and patient safety.

Question: 683

You are preparing a 40 L batch of dialysate with a bicarbonate concentration of 37 mmol/L using a concentrate with a strength of 840 g/L (10 mmol/g). The formula for bicarbonate volume is: $\text{Volume (L)} = (\text{Total Volume} \times [\text{HCO}_3^-]) \div \text{Concentrate Strength}$. After mixing, the conductivity is 14.1 mS/cm (expected 13.5–14.0 mS/cm), and the pH is 7.5, above the acceptable range of 7.2–7.4. What is the most

likely cause of these readings?

- A. Temperature sensor malfunction
- B. Contaminated water treatment system
- C. Incorrect acid concentrate proportion
- D. Excess bicarbonate concentrate added

Answer: D

Explanation: Calculating the required bicarbonate: $(40 \text{ L} \times 37 \text{ mmol/L}) \div 10 \text{ mmol/g} = 148 \text{ g}$. The high pH (7.5) and elevated conductivity (14.1 mS/cm) suggest an alkaline dialysate, most likely due to excess bicarbonate concentrate, which increases both parameters. A contaminated water system would likely affect conductivity differently (e.g., due to ions like chlorine), and an incorrect acid proportion would lower pH. A temperature sensor issue would primarily affect temperature readings, not pH or conductivity directly.

Question: 684

A 67-year-old female patient with ESRD completes a 4-hour hemodialysis session. Her pre-dialysis weight was 70 kg, and her dry weight is 67 kg. The prescribed fluid removal was 3.3 liters, including 0.3 liters for rinseback, with an UF rate of 825 mL/h. Post-dialysis, her weight is 66.8 kg, and she reports weakness and lightheadedness. Her blood pressure is 92/50 mmHg, and her pulse is 102 bpm. What is the most appropriate post-treatment intervention?

- A. Order electrolyte panel to check for hypokalemia
- B. Administer 250 mL normal saline and monitor vital signs
- C. Increase fluid removal goal for next session
- D. Schedule an access flow study

Answer: B

Explanation: The post-dialysis weight (66.8 kg) is below the dry weight (67 kg), indicating over-ultrafiltration (3.2 kg removed vs. 3 kg intended). Weakness, lightheadedness, hypotension, and tachycardia suggest hypovolemia. Administering 250 mL saline restores volume, and monitoring vital signs assesses response. Increasing fluid removal is inappropriate, and electrolyte imbalance or access issues are less likely given the weight discrepancy.

Question: 685

A dialysis clinic is implementing CMS-required isolation procedures for an HBsAg-positive patient (HBV DNA 3.2×10^5 IU/mL). The dedicated station's blood pressure cuff is soiled with blood. What is the correct cleaning and disinfection procedure per CDC guidelines?

- A. Wipe with 70% isopropyl alcohol for 1 minute

- B. Use a quaternary ammonium wipe for 3 minutes
- C. Soak in 1:100 bleach solution for 2 minutes
- D. Clean with detergent, then disinfect with 1:10 bleach for 1 minute

Answer: D

Explanation: Blood-soiled surfaces require cleaning with detergent to remove organic material, followed by disinfection with a 1:10 bleach solution for 1 minute to inactivate HBV, per CDC guidelines. Alcohol and quaternary ammonium compounds are ineffective.

Question: 686

During a dialysis session, a patient with a recent kidney transplant suddenly develops hypotension (BP 90/60 mmHg), tachycardia (HR 110 bpm), and fever (38.5°C). The technician suspects possible graft rejection or infection. According to professional guidelines, which action should the technician prioritize to ensure compliance with government regulations and patient safety protocols?

- A. Administer a 500 mL normal saline bolus to stabilize blood pressure
- B. Immediately notify the nephrologist and document the findings
- C. Increase the dialysate flow rate to 800 mL/min to enhance clearance
- D. Stop dialysis and administer broad-spectrum antibiotics

Answer: B

Explanation: Government regulations, such as those from the Centers for Medicare & Medicaid Services (CMS), emphasize timely reporting of critical patient changes to the supervising nephrologist and thorough documentation. Hypotension, tachycardia, and fever in a transplant patient suggest serious complications like graft rejection or infection, requiring immediate physician evaluation. Administering fluids or antibiotics without a physician's order is outside the technician's scope of practice, and altering dialysate flow does not address the acute symptoms.

Question: 687

A 60-year-old male patient with an AV graft completes dialysis. The dialyzer shows 10% fiber clotting, and the Kt/V is 1.3, slightly below the target of 1.4. The blood flow rate was 350 mL/min, and the heparin dose was 2000 units bolus. What is the most appropriate action to improve dialyzer efficiency next session?

- A. Increase the blood flow rate to 400 mL/min and maintain heparin dose.
- B. Increase the heparin bolus to 2500 units and inspect the dialyzer.
- C. Switch to a high-flux dialyzer and reduce dialysis time.
- D. Adjust the dialysate flow rate to 1000 mL/min.

Answer: B

Explanation: A Kt/V of 1.3 and 10% clotting suggest marginal dialyzer efficiency, likely due to inadequate anticoagulation. Increasing the heparin bolus to 2500 units and inspecting the dialyzer addresses the clotting issue. Higher blood flow or dialysate flow may help but doesn't target clotting directly, and a high-flux dialyzer may increase clotting risk.

Question: 688

A 72-year-old male patient with ESRD arrives for dialysis with a right arm AV graft. The physician's order specifies a blood flow rate of 380 mL/min, dialysate flow rate of 700 mL/min, and a 2 mEq/L potassium bath. Upon inspecting the reuse dialyzer, you note a small blood clot in the header and a clearance rate (K) of 210 mL/min from the last session (original K: 250 mL/min). The patient's pre-dialysis weight is 78 kg, and his EDW is 75 kg. What is the most appropriate action regarding the dialyzer?

- A. Use the dialyzer after rinsing with saline
- B. Proceed with dialysis and monitor for clotting
- C. Adjust the blood flow rate to compensate for reduced clearance
- D. Replace the dialyzer due to the blood clot

Answer: D

Explanation: A visible blood clot in the dialyzer header indicates inadequate reprocessing or potential contamination, posing a risk of embolism or infection. Rinsing with saline does not ensure safety, as microscopic clots or biofilm may remain. Adjusting the blood flow rate does not address the clot or the reduced clearance rate (210 mL/min, 84% of original), which is below the acceptable threshold for reuse (typically 90% of original clearance). Monitoring for clotting is insufficient, as the dialyzer is already compromised. Replacing the dialyzer is the safest and most appropriate action.

Question: 689

A patient's lab results show a urea reduction ratio (URR) of 60% (target: $\geq 65\%$). The technician reviews the treatment: blood flow rate 350 mL/min, treatment time 3 hours, dialyzer clearance 220 mL/min. Which documentation action should the technician take to support treatment process improvement?

- A. Note the dialysate temperature
- B. Record the patient's dietary protein intake
- C. Document the URR and collaborate with the nurse to adjust treatment parameters
- D. Log the patient's pre-dialysis weight

Answer: C

Explanation: A low URR indicates inadequate dialysis clearance. Documenting the URR and collaborating with the nurse to adjust treatment parameters (e.g., increasing treatment time or blood flow) supports process improvement. Dietary intake, dialysate temperature, or pre-dialysis weight are not directly related to URR optimization.

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