BONENT Certified Hemodialysis Technologist/Technician (CHT) Practice Exam (Sample)

Study Guide

Everything you need from our exam experts!

Questions

1. What is ethylene oxide commonly used for?

A. Aging dialyzers

B. Sterilizing most new dialyzers

C. Disinfecting blood samples

D. Cleansing dialyzer tubing

2. What does biocompatibility measure regarding a dialysis membrane?

A. The strength of the membrane

B. The extent of compatibility with the human body

C. The rate of diffusion through the membrane

D. The thickness of the membrane

3. What does the term pruritus refer to?

A. Pain

B. Dizziness

C. Itching

D. Swelling

4. Which hormone helps in regulating the body's calcium levels?

A. Erythropoietin

B. Calcitriol

C. Aldosterone

D. Insulin

5. What is an example of a factor that leads to prerenal failure?

A. Blow to the kidneys

B. Kidney stones

C. Kinked ureter

D. Heart disease

6. What does the process of back washing involve?

- **A. Circulating blood within a patient**
- **B. Sending water from the bottom filter to the top**
- **C. Flushing out patient lines**
- **D. Cleaning dialysis machines with steam**

7. What is the condition characterized by large fluid-filled cysts in the kidneys?

- **A. Polycystic kidney disease**
- **B. Chronic kidney disease**
- **C. Acute renal failure**
- **D. Nephrotic syndrome**

8. What does conductivity in a dialysis system indicate?

- **A. The temperature of the dialysis fluid**
- **B. The pH level of the dialysis fluid**
- **C. The ability of the fluid to conduct electricity**
- **D. The flow rate of the dialysis fluid**

9. What is the primary cause of intrarenal failure?

- **A. Obstruction in urine flow**
- **B. Injury to the kidneys**
- **C. Low blood volume**
- **D. Severe dehydration**

10. How do hospitals typically ensure the accuracy of dialysate concentrations?

- **A. By regular cleaning of the dialyzer**
- **B. With frequent calibrations of the proportioning system**
- **C. By monitoring the patient's weight**
- **D. Through visual checks of the dialysis machine**

Answers

1. B
2. B
3. C
4. B
5. D
6. B
7. A
8. C
9. B
10. B

Explanations

1. What is ethylene oxide commonly used for?

A. Aging dialyzers

B. Sterilizing most new dialyzers

C. Disinfecting blood samples

D. Cleansing dialyzer tubing

Ethylene oxide is a colorless gas widely recognized for its effectiveness as a sterilizing agent, particularly in the healthcare sector. It is commonly used to sterilize medical equipment and supplies, including new dialyzers, before they are put to use in patient care. The process involves using ethylene oxide to achieve terminal sterilization, which ensures that any microbial contamination is eliminated, allowing the devices to be safe and ready for patient treatment. When new dialyzers are manufactured, they may contain residuals or be exposed to the environment, which could introduce pathogens. Sterilizing them with ethylene oxide assures that they are free from any harmful microorganisms, making them suitable for use in hemodialysis and other medical procedures. This fundamental application is crucial for maintaining patient safety and preventing potential infections that could arise from non-sterile equipment.

2. What does biocompatibility measure regarding a dialysis membrane?

A. The strength of the membrane

B. The extent of compatibility with the human body

C. The rate of diffusion through the membrane

D. The thickness of the membrane

Biocompatibility refers specifically to the degree to which a material, in this case, a dialysis membrane, can interact with biological systems without provoking an adverse reaction. When evaluating a dialysis membrane, it's crucial that the material does not cause harm to the patient's body, nor does it instigate a negative immune response. Biocompatibility ensures that the membrane allows for safe and effective diffusion of waste products and excess fluids while minimizing interactions that could lead to complications for the patient, such as inflammation or thrombosis. This characteristic is particularly essential because the membrane is in direct contact with blood during the hemodialysis process, and thus the body's response to the membrane material can directly influence treatment outcomes. Other aspects, such as the strength, diffusion rate, or thickness of the membrane, are important in their own right, but they do not address the critical interaction between the membrane and the patient's body. Therefore, understanding biocompatibility is fundamental for ensuring patient safety and the efficacy of the dialysis treatment.

3. What does the term pruritus refer to?

A. Pain

B. Dizziness

C. Itching

D. Swelling

Pruritus specifically refers to the sensation of itching. It can be caused by various factors, including skin conditions, allergic reactions, or as a complication of underlying health issues like kidney disease. In the context of hemodialysis patients, for instance, pruritus is a common complaint due to the accumulation of waste products and other irritants that can affect the skin. Understanding this term is important in nursing and patient care, as it helps in assessing and managing patient comfort and symptom relief effectively. The other terms relate to different sensations or symptoms; for example, pain implies discomfort, dizziness refers to a sensation of unsteadiness, and swelling denotes an increase in size or volume of a body part, all of which are distinct from the sensation of itching that pruritus describes.

4. Which hormone helps in regulating the body's calcium levels?

A. Erythropoietin

B. Calcitriol

C. Aldosterone

D. Insulin

Calcitriol is the active form of vitamin D and plays a crucial role in regulating the body's calcium and phosphorus levels. It is produced in the kidneys and acts to increase the absorption of calcium and phosphorus from the gastrointestinal tract, promote calcium reabsorption in the kidneys, and mobilize calcium from the bones when necessary. By enhancing the availability of calcium in the blood, calcitriol helps to ensure that various physiological processes that depend on calcium, such as muscle contraction and nerve transmission, function optimally. Erythropoietin is primarily involved in stimulating red blood cell production rather than regulating calcium levels. Aldosterone is a hormone that helps regulate sodium and potassium levels and has an effect on blood pressure but does not play a direct role in calcium homeostasis. Insulin is mainly responsible for glucose metabolism and promoting the uptake of glucose by cells and does not have a significant role in calcium regulation.

5. What is an example of a factor that leads to prerenal failure?

A. Blow to the kidneys

B. Kidney stones

C. Kinked ureter

D. Heart disease

Prerenal failure is primarily caused by factors that impair blood flow to the kidneys, leading to decreased perfusion and ultimately reduced glomerular filtration rate. Heart disease falls into this category because it can significantly affect the heart's ability to pump blood effectively. Conditions such as heart failure reduce cardiac output, which decreases the amount of blood reaching the kidneys. As a result, the kidneys do not receive adequate blood flow to maintain normal function, leading to prerenal azotemia. The other options represent different types of issues. A blow to the kidneys would be a form of injury that directly affects renal tissue, indicating a renal (intrinsic) failure rather than prerenal failure. Kidney stones, while they can obstruct urinary flow, generally lead to postrenal failure rather than prerenal. A kinked ureter also causes obstruction, which is characteristic of postrenal failure, as it blocks the outflow of urine and results in back pressure on the kidneys. Therefore, heart disease is the only option directly associated with the factors that can cause prerenal failure through compromised blood flow.

6. What does the process of back washing involve?

A. Circulating blood within a patient

B. Sending water from the bottom filter to the top

C. Flushing out patient lines

D. Cleaning dialysis machines with steam

Back washing is a specific process typically utilized with filters, such as those found in dialysis systems. This process involves sending water through the filter in the reverse direction—from the bottom to the top. The purpose of back washing is to clean and refresh the filter by dislodging contaminants and debris that have accumulated during use. This helps maintain the efficiency and effectiveness of the filtration system, ensuring that the dialysis treatment remains safe and effective for the patient. In the context of hemodialysis, maintaining the integrity and cleanliness of filters is critical because any buildup can affect the quality of the treatment and the overall welfare of the patient. Thus, back washing as described by sending water from the bottom filter to the top is essential for sustaining the optimal operation of the dialysis machine.

7. What is the condition characterized by large fluid-filled cysts in the kidneys?

A. Polycystic kidney disease

B. Chronic kidney disease

C. Acute renal failure

D. Nephrotic syndrome

Polycystic kidney disease is characterized by the development of numerous fluid-filled cysts within the kidneys, which can lead to an enlargement of the kidneys and impair their function over time. This genetic disorder affects kidney structure and function, causing the cysts to progressively expand and potentially cause pain, hypertension, and chronic kidney disease as a result of renal function deterioration. In contrast, chronic kidney disease involves a gradual loss of kidney function over time but does not specifically relate to the presence of cysts. Acute renal failure refers to a sudden decrease in kidney function, often reversible, and does not typically involve cyst formation. Nephrotic syndrome describes a group of symptoms indicating kidney damage, primarily affecting protein handling and leading to significant protein loss in urine, but it also does not involve the development of large cysts in the kidneys. Thus, the distinctive characteristic of polydysplastic kidney disease makes it the correct and specific answer to the question regarding large fluid-filled cysts in the kidneys.

8. What does conductivity in a dialysis system indicate?

A. The temperature of the dialysis fluid

B. The pH level of the dialysis fluid

C. The ability of the fluid to conduct electricity

D. The flow rate of the dialysis fluid

Conductivity in a dialysis system is a critical parameter that indicates the ability of the dialysis fluid to conduct electricity. This property is essential because it reflects the concentration of ions present in the solution. In the context of dialysis, the conductivity measurement helps healthcare professionals monitor the effectiveness of the dialysate in terms of its ionic composition, which directly affects the dialysis treatment's efficiency and patient safety. During dialysis, maintaining proper ion concentrations ensures that waste products are effectively removed from the patient's blood and that necessary electrolytes are balanced. Monitoring conductivity aids in detecting any issues with the dialysate, such as contamination or improper mixing of the solutions. By understanding conductivity, technicians can ensure the dialysate is at the appropriate concentration for effective treatment, thus safeguarding patient health.

9. What is the primary cause of intrarenal failure?

A. Obstruction in urine flow

B. Injury to the kidneys

C. Low blood volume

D. Severe dehydration

Intrarenal failure, also known as intrinsic renal failure, primarily occurs due to injury to the kidneys themselves. This injury can result from various factors, such as acute tubular necrosis (ATN), glomerulonephritis, or exposure to nephrotoxic agents. When the renal tissues are damaged, their ability to filter blood and produce urine effectively is compromised, leading to a decrease in kidney function. Different conditions affect kidney function in various ways, but in the context of intrarenal failure, the direct injury to the nephrons, which are the functional units of the kidneys, is the critical factor. This damage can disrupt the kidneys' ability to regulate fluid and electrolyte balance and remove waste products from the blood. Other options, while they can contribute to kidney issues, are associated more with prerenal or postrenal failure rather than intrarenal failure. Obstruction in urine flow typically leads to postrenal failure, while low blood volume is often related to prerenal failure due to decreased perfusion to the kidneys. Severe dehydration can also lead to prerenal failure by reducing blood flow to the kidneys, rather than causing direct injury to the renal tissues. Thus, injury to the kidneys represents the primary cause of intraren

10. How do hospitals typically ensure the accuracy of dialysate concentrations?

A. By regular cleaning of the dialyzer

B. With frequent calibrations of the proportioning system

C. By monitoring the patient's weight

D. Through visual checks of the dialysis machine

Hospitals typically ensure the accuracy of dialysate concentrations primarily through frequent calibrations of the proportioning system. The proportioning system is responsible for mixing the concentrate and dialysate to achieve the prescribed electrolyte concentrations. Regular calibration ensures that this system is functioning correctly and accurately delivering the desired concentrations, which is critical for the safety and effectiveness of the dialysis treatment. When calibrations are performed, technicians can identify and correct any discrepancies in the mixing process, minimizing the risk of unintended deviations that could affect patient outcomes. Ensuring that the proportioning system is correctly calibrated is essential for providing consistent and precise dialysate compositions, which play a vital role in removing waste products and maintaining electrolyte balance during hemodialysis. Other methods, such as regular cleaning of the dialyzer, monitoring patient weight, and conducting visual checks of the dialysis machine, have their own importance in the overall procedure but do not directly address the accuracy of the dialysate concentrations. Proper maintenance and monitoring support the system's overall functionality but are secondary to the critical function of calibrating the proportioning system for dialysate accuracy.