Nursing

NNCC-CCHT

Certified Clinical Hemodialysis Technician

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Question: 1

A low-pressure alarm in the venous (post-dialyzer) line is likely to be set off by:

A. a blockage in the blood tubing between the monitoring site and the venous needle.
B. an infiltration of the venous needle.
C. a clot in the venous access.
D. a blockage in the blood tubing before the monitoring site.

Answer: D

Explanation:
Post-dialyzer or venous pressure is that in the tubing returning blood from the dialyzer to the patient's venous access. A low-pressure alarm may be set off by a separation of the blood tubing from the venous needle or catheter, a fall in the blood flow rate, a blockage in the tubing before the venous monitor, or a major clot in the dialyzer. The high-pressure venous alarm may be set off by a blockage of the blood tubing between the monitoring site and the patient's venous access, poor positioning or infiltration of the venous needle, a poorly working central venous catheter, or a clot in the venous access.

Question: 2

High-output cardiac failure is a complication of arteriovenous fistula or grafting. All of the following actions are a part of this condition EXCEPT:

A. increased venous return to the heart.
B. decreased cardiac workload.
C. reduced resistance in the arterial bed.
D. activation of the renin—angiotensin system.

Answer: B

Explanation:
High-output cardiac failure may be seen in patients with anemia, hyperthyroidism, or arteriovenous shunts. The latter increases the venous return to the heart (by 20% or more), increasing the cardiac workload and decreasing the arterial resistance. Tachycardia and hypotension may occur. Symptoms of heart failure, such as dyspnea (shortness of breath) and peripheral edema, will ensue. Often patients with end stage renal disease are anemic or have coexisting heart disease, which worsens the problem. Treating anemia to hemoglobin levels above 10—11 g/dL and perhaps use of inotropic (heart contraction stimulants) drugs may help. Because the kidneys are not functional, diuretics are not useful. Reducing fluid gain between dialyses and removing more fluid by longer or more frequent dialyses may also be beneficial.

Question: 3

Professionalism for a hemodialysis technician includes:

A. using a patients first name or nickname to make the dialysis experience less formal.
B. discussing personal problems with the patient as a way of sharing misfortune.
C. keeping busy at all times to indicate that the technician is a critical member of the team.
D. refraining from talking about a patient to a colleague if the conversation may be overheard.

Answer: D

Explanation:
Professionalism is defined by "exhibiting a courteous, conscientious, and business-like manner in the workplace." While politeness is mandatory and patient dignity is always to be maintained, the patient is there for medical treatment and is not a friend. Thus, first names or nicknames should not be used without request, and the technician should avoid discussing personal problems or plans with the patient. There is a temptation to make the patient feel more at ease or worry less if good results of other patients are shared, but this too should be avoided. All personal information concerning patients must be kept private, and the patient's medical or other problems must not be discussed with others as their privacy must be maintained. It is permissible to take a short break to talk with a patient calmly. Excessive shouting running, or constant busyness may only add to the patient's anxiety.

Question: 4

A heavyset patient arrives for dialysis in a wheelchair. He has difficulty standing without assistance. Which technique would be most appropriate to transfer him to the dialysis chair?

A. Portable lift device
B. Slide board
C. Stand and pivot
D. Simple three person lift

Answer: A

Explanation:
Transferring patients from a wheelchair to the dialysis chair and back may be done by several different techniques, depending on the weight of the patient and his or her ability to bear weight and assist with the transfer. Patients who can stand by themselves may be transferred by a single person, using the stand and pivot technique. This requires the use of a canvas belt around the patient's waist to assist standing then the patient is pivoted and lowered into the dialysis chair. The belt is then removed. A chair-to-chair transfer from a sitting position may be done, using a slide board. Two additional people are needed: one to help the patient as he or she slides on the board and another to lock and hold the wheelchair. For heavy patients unable to assist in the transfer, a portable lift device is preferable. This maneuver requires at least two staff people, one to move the

lift and another to adjust the patient to the correct position in the dialysis chair.

Question: 5

Common sites of stenosis in patients with an arteriovenous fistula include all the following EXCEPT:

A. the vein next to the anastomosis.
B. along the outflow vein
C. the large draining vein of the arm near the shoulder.
D. the artery next to the anastomosis.

Answer: D

Explanation:
Stenosis is a narrowing of the blood vessel conducting blood through the anastomosis. It reduces the blood flow and predisposes to thrombosis. The common sites are in the vein next to the anastomosis, a so-called juxta-anastomotic stenosis; anywhere along the course of the outflow vein, at a previous needle insertion site: or in a more central vein. particularly in the upper-shoulder region, possibly due to a previous central catheter. A high-pitched bruit a water hammer pulse, diminished thrill, or difficulty inserting needles may all be signs of stenosis. There also may be increased venous pressure and swelling of the patient's access limb and an inability to obtain the prescribed blood flow rate. Some stenoses may be treated with angioplasty, while others require surgical revision.

Question: 6

What is an endotoxin?

A. It is a germicide
B. It is not adsorbed by dialysis membranes
C. It is a toxin produced by certain bacteria
D. It is a substance that is not harmful to the patient

Answer: C

Explanation:
Bacteria and endotoxin may enter the dialysate. A common source is the water used to make the dialysate. The endotoxin is a lipopolysaccharide or lipooligosaccharide portion of the bacterial cell wall and has immunogenic properties. It is present in the outer membrane of certain gram-negative bacteria and may cause pyrogenic reactions or septic shock in the patient if it enters the blood. Both bacteria and endotoxin may be adsorbed to the housing, support structure, and membranes of the dialyzer. Use of outdated germicides or inadequate exposure time may allow bacterial growth. The Association for the Advancement of Medical Instrumentation has established standards for bacterial and endotoxin concentration in the reprocessing water: less than 200 bacterial colony forming units and less than 2 endotoxin units/mL If there is a pyrogenic reaction or septicemia, the center must stop reprocessing and must evaluate the entire process.

Question: 7

A diet restricting all of the following is appropriate for a renal failure patient EXCEPT for:

A. potassium.
B. calcium.
C. phosphate.
D. fluids.

Answer: B

Explanation:
The kidneys play a major role in fluid and electrolyte balance, acid—base balance, waste excretion, and the production of erythropoietin. When renal failure occurs, waste, fluid, and certain ionic species tend to accumulate in the body. This may lead to hypertension, edema, metabolic acidosis, and pulmonary congestion. Potassium and phosphate tend to be retained so that foods rich in these substances should be limited. Phosphate elevation in the blood reduces the calcium level by forming calcium phosphate. Lowering of serum calcium stimulates the parathyroid glands to produce parathyroid hormone, so-called secondary hyperparathyroidism. This hormone increases calcium release from bone and may lead to weak demineralized (osteoporotic) bone. Since the kidneys cannot excrete phosphate well in renal failure, phosphate binders are usually given to prevent hyperphosphatemia, and vitamin D is given to enhance calcium absorption.

Question: 8

To diminish vasovagal reactions and needle phobia in the dialysis patient, the technician should ask the patient to:

A. lie down in a recumbent position.
B. tense the muscles in the nonaccess hand for 10—20 seconds during needle insertion.
C. cannulate his or her own vessels.
D. do all of the above.

Answer: D

Explanation:
One in ten patients have a fear (phobia) of needles or blood, and a so-called vasovagal reaction may occur. This is characterized by a brief rise in pulse rate and blood pressure followed by a marked slowing of the pulse and a drop in blood pressure. The latter often leads to sweating. dizziness, and fainting. Preventive measures include recumbent posture rather than sitting during needle insertion: tensing the muscles ofthe nonaccess limbs for 10-20 seconds, relaxing and then repeating while the needle is being inserted: teaching the patient to insert his or her own needles, preferably using the buttonhole technique; and avoiding the pain of needle insertion by distraction (listening to music, watching television) or skin stretching by the so-called three-point technique. Local anesthetic (e.g„ lidocaine), topical anesthetic, or ethyl chloride spray may also lessen the pain

of needle insertion.

Question: 9

Which hemodialysis schedule is likely to be most efficient?

A. In-center hemodialysis, 3—4 hours a session, 3 days a week
B. Conventional home hemodialysis
C. Short daily home hemodialysis, 2-3 hours a session, 5—7 days a week
D. Nocturnal home hemodialysis, 8 hours during sleep, 3 days a week

Answer: C

Explanation:
Most hemodialysis in the United States is done in centers, usually 3—4 hours a session, 3 days a week The presence of nurses, technicians, and other patients is often reassuring to the individual undergoing treatment However, the time commitment may interfere with work schedules or parenting of young children. Some centers offer night treatment with the patient sleeping over while having hemodialysis. Home hemodialysis, using dialyzers appropriately designed for home use, is another option, but the patient and spouse or partner must undergo training regarding techniques and standard procedures and a plan of action in emergencies. Nocturnal home hemodialysis during sleep allows prolonged treatment and has been shown to reduce many of the symptoms of chronic renal disease. Probably the most efficient schedule is that of the newer short daily home hemodialysis, usually 2-3 hours a session, 5—7 days a week The initial 2 hours of dialysis are the most efficient, and the shortened time schedule allows more time for work and recreational activities.

Question: 10

Which site in the hemodialysis pathway has the highest positive pressure?

A. Arterial blood in the afferent tubing
B. Blood entering the dialyzer fibers
C. Blood leaving the dialyzer fibers
D. Blood in the venous return

Answer: B

Explanation:
In hemodialysis, arterial blood is conducted through tubing to a pump, which forces the blood through the hollow fibers in the dialyzer. The pre-pump blood usually has a negative pressure, while the post-pump blood (arterial header) about to enter the hollow fibers has the highest positive pressure, the value depending on the resistance of the fibers. Pressure then diminishes over the length of the fiber, and the pressure in the venous return is the lowest positive pressure in the system. The dialysis machine can control the pressure differential between the dialysate and the blood, the so-called transmembrane pressure. This may be adjusted to control the

amount of fluid removal. The average pressure difference between blood entering and leaving the dialyzer fibers determines the net hydraulic pressure, forcing fluid out of the blood, through the membrane, and into the dialysate.

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