

Medical Equipment (2) – Sheet #1

Part I. Complete the following sentences:

1. Waste metabolites are removed from the patient's blood in hemodialysis using a process called ...
2. To prevent cross-infection, blood line in hemodialysis is ...
3. Detection of wrong input dialysate concentrates in hemodialysis can be done using ...
4. Air bubble detection is usually implemented based on ... sensors.
5. Blood leak detection is usually implemented based on ... sensors.

Part II. Mark the following statements as True (T) or False (F):

6. False blood leak and conductivity alarms can be caused by air bubbles in the dialysate.
7. Dialysate line is disposable for patient safety.
8. pH monitors can be added in some hemodialysis machines to ensure that the mixed dialysate is safe.
9. In hemodialysis machines, venous pressure must be higher than arterial pressure.
10. Air in the dialysate is completely harmless to the patient and the accuracy of the dialysis treatment.
11. Integrity of the blood circuit in hemodialysis is monitored by blood leak detector.
12. Bypass valve is usually activated to bypass dialyzer during alarm conditions.
13. Blood line must be disinfected before it is used with another patient.
14. Conductivity monitor in hemodialysis can detect condition with wrong concentrates are used.
15. Chemical deposits in dialysis machine can interfere with flowwater-based ultrafiltration control.
16. Dialysis machines are not true fail-safe devices.
17. Ultrasonic air-foam detectors are more widely used in new dialysis machines.
18. When there is a dialysate conductivity alarm, blood circuit must stop.
19. It is necessary to use a peristaltic pump for the dialysate circuit.
20. It is possible to control water removal rate but not waste metabolite removal in hemodialysis.
21. Coagulation of blood in extracorporeal circuit is prevented using continuous heparin infusion.
22. It is possible to control the extracorporeal blood flow rate in hemodialysis.
23. Modern hemodialysis systems with new safety features require no human monitoring of operation.
24. Not all hemodialysis systems are equipped with pH monitor.
25. Cold dialysate has been known to precipitate cardiac arrhythmias.
26. Bypass valve is usually activated to bypass dialyzer during priming.
27. Blood pump must be disinfected in between patients.
28. It is important to program dialysis machine with correct acid:bicarbonate:water ratio for safety.
29. Reflected light air-foam detectors are more widely used in new dialysis machines.
30. When there is a dialysate temperature alarm, blood circuit must stop.
31. If acid and bicarbonate inputs to proportioning circuit are reversed, pH monitors can detect this.

Part III. Answer these questions by marking the best answer from the choices given:

32. Arterial blood line in hemodialysis machines has ... than venous blood line.
- Higher pressure
 - Lower pressure
 - Same pressure
33. Blood line clamp is activated in the condition when ...
- Air was detected in blood
 - High blood temperature was detected
 - High blood pressure was detected
34. Deaerator is used in dialysate circuit to ...
- Prevent air bubbles from forming in the blood
 - Prevent cooling of the dialysate
 - Make the dialysis process more efficient
35. Ultrafiltration rate measurement systems cannot be designed based on ...
- Flow sensing
 - Balancing chamber
 - Pressure sensing
36. To measure the ultrafiltration at required accuracy in AAMI standard using flow sensors, the flowmeters used must have an accuracy of ... (Assume the dialysate flow rate as 1L/min and assume it is required to remove 1 Kg of water from the patient every hour during the treatment)
- $\pm 5 \%$
 - $\pm 0.5 \%$
 - $\pm 0.05 \%$
37. When there is a break in the dialyzer, ... happens.
- Blood leaks from blood circuit to dialysate circuit
 - Dialysate leaks from dialysate circuit to blood circuit
 - Mixing of blood and dialysate happens in both circuits
38. If one pump is used in the dialysate circuit, it should be placed ...
- Before the dialyzer
 - After the dialyzer
 - Before or after the dialyzer
39. Correct amount mixing of dialysate components is checked using ...measurements.
- Temperature
 - concentration
 - Conductivity
40. To prevent the chemical buildup of carbonate deposits, dialysis machines are rinsed with ...
- Bleach
 - Acetic acid (vinegar)
 - Hot water
41. Conductivity monitors measurements have units of ...
- mS
 - mS/cm
 - mS/cm²
42. Arterial pressure in dialysis machines is always ...
- Negative
 - Positive
 - Zero