Total Question: 400 QAs

1. Following capillary blood collection, a bandage should be applied to the heel or finger of patients who are _____.

a. 2 years or older Correct

b. 1 year or older

c. 6 months or older

d. 3 months or older

Following capillary blood collection, a bandage should be applied to the heel or finger of patients who are 2 years old or older. Newborns and infants younger than 2 should not be bandaged because the bandage may pose a choking risk because of the child's tendency to put things in the mouth, and the skin is too friable and may become irritated or tear when the bandage is removed.

2. If a child weighs 34 lb, the maximum volume of blood that can be drawn in a 24-hr period is _____.

a. 25 mL

b. 50 mL

c. 100 mL Correct

d. 200 mL

CLSI guidelines recommend for pediatric patients that the amount of blood drawn in 24 hours be no more than 5% of the patient's total blood volume, using 65-70 mL/kg as the estimate for blood volume.

$$34\ \text{lb} \times \frac{1\ \text{kg}}{2.2\ \text{lb}} = 15.45\ \text{kg}$$

$$15.45\ \text{kg} \times 65\frac{\text{mL}}{\text{kg}} = 1005\ \text{mL}$$

5% of that total volume would be approximately 50 mL, the maximum volume of blood that can be drawn in 24 hours for this patient. Care must be taken to avoid withdrawing more than 5% of the child's total blood volume in a 24-hr period. Additionally, the phlebotomist must consider the maximum amount of blood volume that can be withdrawn within other time periods. CLSI regulations limit the amount of blood drawn over an 8-week period to no more than 10% of the patient's total blood volume.

3. If a patient is undergoing analysis of gastric fluids before and after a gastric stimulant, for what blood test is the phlebotomist likely to need to collect a specimen?

a. CBC.

b. Uric acid.

c. Serum gastrin. Correct

d. Albumin.

If a patient is undergoing analysis of gastric fluids before and after a gastric stimulant, the blood test that the phlebotomist is likely to need to collect a specimen for is serum gastrin, which evaluates gastric production. The serum is collected in a red- or gray-topped tube. Gastric fluid analysis and serum gastrin are tested to help diagnose chronic gastritis, chronic renal failure, gastric and duodenal ulcers, gastric carcinoma, G-cell hyperplasia, pernicious anemia, pyloric obstruction, and hyperparathyroidism.

4. The most common reason for rejecting a specimen for chemistry is _____.

a. an underfilled tube

b. an overfilled tube

c. clotting

d. hemolysis Correct

The most common reason for rejecting a specimen for chemistry is hemolysis, whereas the most common reason for hematology is clotting. Other reasons that specimens may be rejected include overfilling or underfilling a tube because this alters the required ratio of additive to specimen and can interfere with the testing results. Specimens transported and handled in the wrong collection tube, at the wrong temperature, with the wrong additive, or with exposure to light (if photosensitive) may also be rejected.

5. One of the reasons that serum is more often used for testing than plasma is that serum contains _____.

a. more antigens Correct

b. fewer antigens

c. more anticoagulants

d. fewer gases

One of the reasons that serum is more often used for testing than plasma is that serum contains more antigens, so it can be used to carry out a wider variety of tests. Additionally, anticoagulants found in plasma may interfere with some tests. While plasma may be administered as transfusions, serum is much more commonly used for testing, although in some cases, a test can be done with either plasma or serum.

6. The primary function of leukocytes is to _____.

a. oxygenate the cells

b. carry solutes

c. promote coagulation

d. neutralize or destroy pathogens Correct

The primary function of leukocytes (white blood cells) is to neutralize or destroy pathogens through phagocytosis (engulfing and destroying) or the production of antibodies. There are five types of leukocytes:

Neutrophils	54–62%	Destroy pathogens with phagocytosis.
Eosinophils	≤3%	Ingest/Detoxify foreign protein.
Basophils	<1%	Release histamine and heparin, and promote an inflammatory response.
Lymphocytes	24–38%	T-cells attack infected cells; B-cells produce antibodies.
Monocytes	3–7%	Destroy pathogens with phagocytosis.

7. **If a patient complains of nausea after a blood draw, the most appropriate response is to _____.**

a. reassure the patient that the venipuncture is completed

b. give the patient an emesis basin and encourage deep breathing Correct

c. give the patient a drink of cold water

d. put the patient into the flat supine position

If a patient complains of nausea after a blood draw, the most appropriate response is to give the patient an emesis basin (because nausea often leads to vomiting) and encourage deep breathing because this sometimes eases nausea. A cool, damp cloth may also be applied to the patient's forehead. In most cases, nausea subsides within a few moments, but first-aid personnel should be notified. If the patient is lying flat and supine, he or she should be turned to one side to avoid aspiration if vomiting occurs.

8. **If a patient is heavily tattooed on both arms, from shoulders to wrists, with no areas left open, the most appropriate site for venipuncture is _____.**

a. any site

b. the antecubital area with the oldest tattoos

c. the dorsal metacarpal veins Correct

d. an area without solid dye

If a patient is heavily tattooed on both arms, from shoulders to wrists with no areas left open, the most appropriate site for venipuncture is the dorsal metacarpal veins. Tattooed areas should be avoided if possible because they may harbor infection (if done recently) and may mask signs of inflammation or bruising. If it is necessary to withdraw blood from a tattooed area, it is important to try to find an area that is open and free of dye, especially solid-dyed areas.

9. **All lab samples should be handled according to _____.**

a. airborne precautions

b. contact precautions

c. universal precautions

d. standard precautions Correct

All lab samples should be handled according to standard precautions, which combine universal precautions and body substance precautions because of the concern that not all infectious processes are obvious or identified. With body substance isolation, gloves must be worn for all contact with blood, body fluids, and any moist body surface such as mucous membranes. With universal precautions, all blood and body fluids are considered potentially infectious. Standard precautions also require respiratory hygiene/cough etiquette.

10. **When a fasting urine test is ordered for glucose testing, this requires that which one of the following be collected?**

a. Any urine specimen after a specified period of fasting.

b. The first urine specimen voided after a specified period of fasting.

c. The second urine specimen voided after a specified period of fasting. Correct

d. The third urine specimen voided after a specified period of fasting.

When a fasting urine test is ordered for glucose testing, this means that the second urine specimen voided after a specified period of fasting should be collected, usually 8 hours. The first specimen, which is affected by food eaten before the fasting period, is discarded. If a first-voiding specimen is ordered, it is usually collected first thing in the morning after approximately 8 hours of sleep. First-voiding specimens are usually more concentrated than subsequent voids. Random urine specimens may be obtained at any time.

11. When selecting an antecubital vein, priority should be given to veins in the _____.

a. lateral aspect

b. medial aspect

c. median aspect Correct

d. lateral or medial aspect

When selecting an antecubital vein, priority should be given to veins in the median (middle) aspect. These include the median vein and the lateral aspect of the median cubital vein. If these are not satisfactory, the next to consider are the veins in the lateral (outer) aspect, including the cephalic vein and the accessory cephalic vein, although there is increased risk of injury to the lateral nerve. The last to consider are the veins in the medial (inner) aspect. These include the basilic vein and the medial aspect of the median cubital vein. Venipuncture in these veins poses increased risk of injury to the brachial artery and median antebrachial cutaneous nerves.

12. Which of the following panels of tests may provide the best information about a patient with suspected liver dysfunction?

a. BMP

b. CMP Correct

c. Lipid profile

d. Electrolyte panel

The CMP (comprehensive metabolic panel) contains the tests found in the BMP (basic metabolic panel) (blood urea nitrogen [BUN], Ca, CO_2, Cl, creatinine, glucose, K, and Na) as well additional tests that give information about liver function (albumin, ALP, AST, bilirubin, and total protein). While these are fewer specific tests than found in the liver function panel, the CMP is often used to screen for live dysfunction and, if tests are positive, then further testing may be ordered.

13. The best time to obtain a blood specimen for lowest cortisol level is at about_____.

a. Noon

b. Midnight Correct

c. 5 AM

d. 8 PM

The best time to obtain a blood specimen for lowest cortisol level is at about midnight. Increased levels of cortisol indicate adrenal hyperfunction and Cushing syndrome while decreased levels indicate hypofunction and Addison's disease. Cortisol levels exhibit diurnal variation, usually peaking in the early morning (about 8 AM) and reaching the lowest level around midnight, so multiple tests may be ordered at different times. If cortisol tests are abnormal, then additional tests are usually ordered to confirm a diagnosis.

14. If a patient falls and experiences a fractured hip, the phlebotomist expects the patient will be treated in the _____.

a. oncology department

b. outpatient department

c. orthopedic department Correct

d. obstetric department

If a patient falls and experiences a fractured hip, the phlebotomist expects the patient will be treated in the orthopedic department, which specializes in caring for patients with impairments of or injuries to the skeletal system, including fractures. The oncology department specializes in the care of patients with cancer. Obstetrics specializes in the care of pregnant women, including labor and delivery. Outpatient departments, also commonly known as ambulatory care centers, provide same-day treatment and surgical procedures without hospital inpatient admission.

15. Which of the following is NOT a cause of hemolysis?

- a. Failing to air dry antiseptic
- b. Using a larger-than-needed needle Correct
- c. Using a smaller-than-needed needle
- d. Shaking tubes vigorously

Using a larger-than-needed needle does not result in hemolysis (rupturing of RBCs), but using too small of a needle may. Other causes of hemolysis include failing to air dry the antiseptic before venipuncture, withdrawing blood from the area of a hematoma, shaking the collection tube instead of inverting to mix the blood with additive, rapidly emptying blood from a syringe into a collection tube, and withdrawing the plunger on a syringe too forcefully.

16. During venipuncture, the correct position for the needle is _____.

- a. bevel up at a 30-degree angle to the skin Correct
- b. bevel up at a 45-degree angle to the skin
- c. bevel down at a 30-degree angle to the skin
- d. bevel down at a 45-degree angle to the skin

During venipuncture, the correct position for the needle is bevel up at a 30-degree angle to the skin. Inserting at too steep of an angle can result in the needle being inserted too far, and this increases the risk of damage to nerves and arteries. However, if the needle is not inserted deeply enough, it may miss the vein. This may occur in patients whose veins are especially deep or in patients who are markedly obese.

17. The primary organization/agency that accredits laboratories and publishes laboratory checklists is _____.

a. CLSI

b. CAP Correct

c. FDA

d. CDC

The primary organization/agency that accredits laboratories and publishes laboratory checklists is the College of American Pathologists (CAP). CAP accreditation is voluntary, but to qualify, labs must meet standards established in the checklists. CAP produces checklists utilizing standards produced by the Clinical Laboratory Standards Institute (CLSI). Laboratories that are CAP accredited are usually exempt from inspection by government agencies because they are considered in compliance with requirements established by the Clinical Laboratory Improvement Act.

18. A used disposable needle and syringe should _____.

a. have the needle bent to prevent further use

b. have the needle recapped to prevent injury

c. have the needle separated from the syringe

d. be placed as is in a puncture-resistant sharps container Correct

A used disposable needle and syringe should be placed as is in a puncture-resistant sharps container. Needles should not be bent, recapped, or separated from the syringe because any handling of the needle introduces the risk of a needlestick injury. Needles and syringes should be placed in the sharps container immediately after use whenever possible. Sharps that are nondisposable must be placed in a hard-walled container and taken to the processing area to be decontaminated.

19. The main component of erythrocytes is _____.

a. hemoglobin Correct

b. albumin

c. sodium

d. antibodies

The main component of erythrocytes (RBCs) is hemoglobin. Hemoglobin is a complex protein that contains iron; it carries oxygen throughout the body and carries CO_2 back to the lungs. Erythrocytes are the most plentiful blood cells with 4.5–5 million per cubic milliliter of blood. They are concave discs that lack nuclei and have a life expectancy of approximately 120 days. Erythrocytes are produced in the bone marrow in a process called erythropoiesis.

20. Which of the following is NOT a good solution to the dealing with nonstandard shift work, such as 11 PM to 7 AM?

a. Maintain different sleep patterns for working and nonworking days Correct

b. Schedule regular naptimes

c. Avoid caffeinated beverages up to 6 hours before scheduled bedtime

d. Use room-darkening shades while sleeping.

Because it is difficult for the body to adjust to different sleep times, the person working a nontraditional shift, such as 11 PM to 7 AM, should try to maintain the same sleep patterns for both working and nonworking days. Additionally, scheduling a short daily nap and avoiding caffeinated beverages up to 6 hours before scheduled bedtime may help the person get adequate sleep. Keeping the bedroom dark, such as with room-darkening shades, during sleeping hours may help the person get adequate sleep.

21. If a specimen must be chilled, the best method is to _____.

a. place it in a water-and-ice mixture Correct

b. cover it with ice

c. refrigerate it

d. place it in dry ice

If a specimen must be chilled, the best method is to place the specimen in a water-and-ice mixture so that adequate contact is made. Placing it in or on ice alone is not adequate because the cold will not be applied uniformly. Refrigerating the item cools it too slowly, and placing it in dry ice poses the risk that hemolysis may occur because of the extreme temperature change. Whole blood specimens are not usually chilled.

22. Serum differs from plasma in that serum _____.

a. does not contain fibrinogen and clotting factors Correct

b. contains fibrinogen and clotting factors

c. activates fibrinogen and clotting factors

d. does not activate fibrinogen and clotting factors

Serum differs from plasma in that serum does not contain fibrinogen and other clotting factors. Serum is the extracellular liquid portion of plasma, minus fibrinogen, clotting factors, and blood cells. However, serum does contain solutes (proteins, minerals, hormones, gases) and is important as a source of electrolytes. Serum is the product of centrifugation of coagulated blood and consists of 90% water. Serum is commonly used for chemistry testing except for potassium because potassium is released into the serum during the clotting process, resulting in a higher level than in plasma.

23. Which one of the following situations introduces the most risk for error relating to patient ID?

- a. Older adult patient.
- b. Adolescent patient.
- c. Having multiple patients in one room. Correct
- d. Outpatient.

Having multiple patients in one room introduces the most risk for error relating to patient ID because the order may include the wrong bed assignment, so it is especially important to double-check the patient's ID. Because patients may be confused, the wristband should always be checked to verify the person's name. Other situations that increase the risk of error include tests on siblings or twins, newborns, common names (Mary Jones), and names that look alike or sound alike.

24. Which one of the following POC tests measures the volume of RBCs in a patient's blood?

- a. Hgb.
- b. Hct. Correct
- c. INR.
- d. Na.

Hct (hematocrit) (aka packed cell volume [PCV]) measures the volume of RBCs in a patient's blood. A small sample of anticoagulated blood is centrifuged; the results reflect the percentage of cells to liquid. The normal hematocrit value varies according to gender and age:

Age	Male	Female
0 to 1 week	46–68	46–68
1 to 2 months	32–54	32–54
3 months to 5 years	31–43	31–43
6 to 8 years	33–41	33–41
15 to adult	38–51	33–45
Older adult	36–52	34–46

25. The most commonly used needle gauge for venipuncture is _____.

a. 19

b. 21 Correct

c. 23

d. 24

The most commonly used needle gauge for venipuncture is 21. The size of the needle decreases with increasing numbers, so gauge 21 is larger than gauge 23. Using a needle larger than 21-gauge should be avoided because it may result in extra pain and has few benefits. If veins are smaller, then size 23 may be used, but smaller gauges may increase the risk of hemolysis and also increase the time needed to collect a specimen.

26. A venipuncture should never be carried out proximal to a PICC line because _____.

a. the blood will be diluted

b. the catheter may be damaged Correct

c. doing so increases the risk of thrombophlebitis

d. a large discard volume is required

A venipuncture should never be carried out proximal to a peripherally inserted central catheter (PICC) line because the catheter may be damaged when the tourniquet is applied or the needle is inserted and could even break, causing fragments to migrate. If possible, the arm with a PICC line should be avoided for blood draws; however, if it is absolutely necessary, the tourniquet must be placed and the venipuncture is done distal to the PICC line.

27. When collecting a blood specimen from a patient in an isolation room, the phlebotomist should place the collection tray _____.

a. at the nurse's station or another secured area Correct

b. on a table or chair outside of the room

c. on a table or chair immediately inside the room

d. on the bedside table

When collecting a blood specimen from a patient in an isolation room, the phlebotomist should collect the needed supplies and place the collection tray at the nurse's station or in another secured area. The tray should not be left unattended in a public area. Any supplies taken into the isolation room are considered contaminated and cannot then be used for other patients, so they must be properly disposed of. Tourniquets used for isolation rooms should be dedicated to the patient or should be disposable.

28. When collecting a blood specimen for trace elements, such as zinc, the appropriate tube type is _____.

a. plastic

b. element-free Correct

c. glass

d. stopper-free

When collecting a blood specimen for trace elements, such as zinc, selenium, or mercury, the appropriate tube type is element-free. These are specialty tubes designed so that they do not contaminate the sample with trace elements that are typically found in glass and plastic containers. These tubes usually have royal-blue tops and are available with EDTA or heparin, or they are free of additives. Samples for lead testing are collected in tan-topped tubes containing K2 EDTA.

29. The primary focus of CLIA (1988) is to ensure that _____.

a. patients get correct laboratory results Correct

b. patients are reimbursed for errors

c. patients are informed of rights

d. patients are protected from injury

The primary focus of CLIA (Clinical Laboratory Improvement Amendments) (1988) is to ensure that patients get correct laboratory results through requiring that laboratories meet quality standards. Laboratories are required to be certified by state authorities and by CMS (Center for Medicare and Medicaid Services). The three agencies that are responsible for CLIA are:

- FDA (Food and Drug Administration): Categorizes tests and develops rules.
- CMS: Issues certificates, inspects, publishes rules, and monitors lab performance.
- CDC (Centers for Disease Control and Prevention): Provides research, develops information, and manages the advisory committee (CLIAC).

30. The volume of blood that a Microtainer® holds is _____.

a. 0.25 mL

b. 0.5 mL Correct

c. 0.75 mL

d. 1 mL

Because Microtainer® tubes are used to collect very small volumes of capillary blood, such as from a fingerstick, they typically hold up to 0.5 mL of blood. These small containers, also sometimes referred to as “bullets” because of their miniature size, contain the same types of additives as larger evacuated tubes and the caps are color-coded in the same manner so that the additives can be easily identified.

31. When carrying out a rapid test for group A *Streptococci* from a throat swab, if there is no blue control line on the dipstick at 5 minutes, this means that _____.

a. the test is positive

b. the test is negative

c. the test is inconclusive

d. the test is invalid Correct

When carrying out a rapid test for group A *Streptococci* from a throat swab, if there is no blue control line on the dipstick at 5 minutes, this means that the test is invalid, possibly because the dipstick if outdated. For the test, a tube is filled with three drops each of reagent A and B and the swab is placed into the tube for 1 minute and rotated at least five times before removal. The dipstick is then placed in the tube for 5 minutes. The blue control line must appear by 5 minutes for a valid test. A positive finding is a pink or purple test line.

32. Which one of the following is an appropriate question to verify a patient's ID?

a. "Is your name Sally Evans?"

b. "Are you Ms. Evans? What is your birthdate?"

c. "Ms. Evans, were you born on March 16, 1980?"

d. "Can you tell me your name and birthdate?" Correct

An appropriate question to verify a patient's ID is "Can you tell me your name and birthdate?" Asking for direct information is important because if a patient is confused or hard of hearing, he or she may answer "yes" or "no" to questions incorrectly. For inpatients, the ID band should always be checked to verify the information that they provide. If patients do not have an ID band, common in the outpatient setting, then they should be asked to provide and spell their names and provide their birthdates.

33. A patient with an order for blood tests has a clamped PICC line in the left arm, so the phlebotomist should draw blood from the _____.

a. Right arm Correct

b. Left arm, distal to the PICC line

c. Left arm, proximal to the PICC line

d. PICC line

A patient with an order for blood tests has a clamped peripherally inserted central catheter (PICC) line in the left arm, so the phlebotomist should draw blood from the right arm. Drawing blood from a vascular access device, such as a PICC line, is outside of the scope of practice of the phlebotomist; however, the phlebotomist may provide necessary collection tubes to a nurse or physician who accesses the PICC line and may transport the tubes. If a PICC line is in one arm, the alternate arm should be used for venipuncture if possible.

34. During a blood draw and collection in multiple vacuum tubes, if the third tube fails to fill, the most appropriate initial response is to _____.

a. insert the needle deeper into the vein

b. discontinue the venipuncture and try a different site

c. try a different vacuum tube Correct

d. call for assistance

During a blood draw and collection in multiple vacuum tubes, if the third tube fails to fill, the most appropriate initial response is to try a different vacuum tube. Tubes sometimes lose their vacuum. If the new tube also does not fill, then the phlebotomist should check to make sure that the entire bevel of the needle is completely under the skin. If a new tube does not solve the problem and the needle is in the correct place, the venipuncture may need to be discontinued and a new site is tried.

35. Blood specimens for ammonia levels should be separated from the cells and tested within _____.

a. 15 minutes Correct

b. 30 minutes

c. 60 minutes

d. 4 hours

Blood specimens for ammonia levels should be separated from the cells and tested within 15 minutes because the levels increase rapidly at room temperature. Specimens should be transported in an ice slurry or cooling tray and processed immediately. Blood ammonia levels are often checked to diagnose or monitor hepatic encephalopathy, which can result in toxic levels of ammonia. Other causes of increased ammonia include upper gastrointestinal tract bleeding, salicylate poisoning, liver failure, kidney disease, and parenteral nutrition.

36. The infections most commonly transmitted through needlestick and sharp injuries are _____.

a. HBV, HCV, and HIV Correct

b. HBV, HIV, and HZV

c. HIV, syphilis, and CMV

d. HBV, HB, and HZV

The infections most commonly transmitted through needlestick and sharp injuries are HBV (hepatitis B virus), HCV (hepatitis C virus), and HIV (human immunodeficiency virus). While these viruses pose the greatest risk—and people may be co-infected, putting the person who has a needlestick or sharp injury at risk of more than one disease—other infectious disorders (more than 20) can also be spread through needlestick and sharp injury, including syphilis, HZV (herpes zoster virus), toxoplasmosis, TB, Rocky Mountain spotted fever, blastomycosis, and cutaneous gonorrhea.

37. The most common plasma protein is _____.

a. fibrinogen

b. albumin Correct

c. alpha globulin

d. beta globulin

The most common plasma protein is albumin. Plasma proteins help to regulate the movement of water between cells and blood, controlling blood volume and affecting blood pressure. Plasma proteins include:

- Albumin (60%): Produced in the liver and maintains colloid osmotic pressure.
- Globulins (36%): Alpha and beta globulins are both produced in the liver. They transport lipids and fat-soluble vitamins. Gamma globulins are produced in lymphatic tissue and act as immune antibodies.
- Fibrinogen (4%): Produced in the liver and involved in coagulation.

38. If a phlebotomist accidentally experiences a slight needlestick that does not draw blood after obtaining a blood sample, the phlebotomist should _____.

a. wash the site with soap and water and take no further action

b. wipe the site with an alcohol swab and verify that there is no bleeding

c. wash the site with soap and water and report the incident Correct

d. flush the site with running water for 20 minutes and report the incident

If a phlebotomist accidentally experiences a slight needlestick that does not draw blood after obtaining a blood sample, the phlebotomist should wash the site with soap and water. The incident must be reported as soon as possible to a supervisor, and needlestick protocol should be followed. This may include testing and/or prophylaxis, depending on the patient's health history. In some cases, the patient may also be tested for communicable diseases, such as HIV, in order to determine the risk to the phlebotomist.

39. If a biohazard sign at the entrance to the laboratory lists the laboratory's biosafety level as 3 (BSL-3), this means that the lab studies infectious agents that _____.

a. do not consistently cause human disease

b. pose a risk if inhaled, swallowed, or exposed to the skin

c. are airborne and could potentially cause lethal disease Correct

d. are airborne, lethal, and for which there is no effective treatment

If a biohazard sign at the entrance to the laboratory lists the laboratory's biosafety level as 3 (BSL-3), this means that the lab handles infectious agents that are airborne and could potentially cause lethal disease, such as COVID-19 and *Mycobacterium tuberculosis*. Biosafety levels:

- BSL-1: Infectious agents do not consistently cause disease.
- BSL-2: Infectious agents pose a risk if inhaled, swallowed, or exposed to the skin.
- BSL-3: As above.
- BSL-4: Infectious agents are airborne, lethal, and no effective treatment is available.

40. The purpose of a blood transfer device is to prevent _____.

a. specimen contamination

b. a needlestick Correct

c. tube breakage

d. spillage

The purpose of a blood transfer device is to prevent a needlestick. The blood transfer device was devised when OSHA required that safety needles be used when collecting blood specimens. These needles cannot be used to inject blood into a collection tube, so the safety needle is removed and the transfer device, which contains a small needle inside, is attached to the Luer. The collection tube is then inserted into the transfer device and the blood is transferred when the needle penetrates the cap.