Preanalytical Considerations

OBJECTIVES

Study the information in your textbook that corresponds to each objective to prepare yourself for the activities in this chapter.

1. Define the key terms and abbreviations listed at the beginning of this chapter.
2. List and describe the physiological variables that influence laboratory test results and identify the tests most affected by each one.
3. List problem areas to avoid in site selection, identify causes for concern, and describe procedures to follow when encountering each.
4. Identify and describe various vascular access sites and devices and explain what to do when they are encountered.
5. Identify, describe, and explain how to handle patient complications associated with blood collection.
6. Identify, describe, and explain how to avoid or handle procedural errors, specimen quality concerns, and reasons for failure to draw blood.
**Matching**

Use choices only once unless otherwise indicated.

**MATCHING 9-1: KEY TERMS AND DESCRIPTIONS**

Match each key term with the *best* description.

<table>
<thead>
<tr>
<th>Key Terms (1–17)</th>
<th>Descriptions (1–17)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. A-line</td>
<td>A. Abnormal accumulation of fluid in the tissues</td>
</tr>
<tr>
<td>2. AV shunt/fistula/graft</td>
<td>B. Blood loss to the point where life cannot be sustained</td>
</tr>
<tr>
<td>3. Basal state</td>
<td>C. Catheter placed in an artery, most commonly the radial</td>
</tr>
<tr>
<td>4. Bilirubin</td>
<td>D. Catheter with a stopcock or cap for delivering medication or drawing blood</td>
</tr>
<tr>
<td>5. CVAD</td>
<td>E. Central vascular access device or indwelling line</td>
</tr>
<tr>
<td>6. CVC</td>
<td>F. Central venous catheter or central venous line</td>
</tr>
<tr>
<td>7. Diurnal/circadian</td>
<td>G. Decrease in blood fluid with an increase in nonfilterable components</td>
</tr>
<tr>
<td>8. Edema</td>
<td>H. Destruction of RBCs and release of hemoglobin into the serum or plasma</td>
</tr>
<tr>
<td>9. Exsanguination</td>
<td>I. Happening daily, or having a 24-hour cycle</td>
</tr>
<tr>
<td>10. Hematoma</td>
<td>J. Product of the breakdown of RBCs</td>
</tr>
<tr>
<td>11. Hemoconcentration</td>
<td>K. Resting metabolic state of the body early in the morning after a 12-hour fast</td>
</tr>
<tr>
<td>12. Hemolysis</td>
<td>L. Surgical joining of an artery and vein</td>
</tr>
<tr>
<td>13. Hemolyzed</td>
<td>M. Swelling or mass of blood caused by blood leaking from a blood vessel</td>
</tr>
<tr>
<td>14. Heparin/saline lock</td>
<td>N. Term used to describe a specimen affected by hemolysis</td>
</tr>
<tr>
<td>15. Iatrogenic</td>
<td>O. Term used to describe a specimen marked by jaundice</td>
</tr>
<tr>
<td>16. Icteric</td>
<td>P. Term used to describe an adverse condition due to the effects of treatment</td>
</tr>
<tr>
<td>17. IV</td>
<td>Q. Within, or pertaining to the inside of a vein</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Key Terms (18–33)</th>
<th>Descriptions (18–33)</th>
</tr>
</thead>
<tbody>
<tr>
<td>18. Jaundice</td>
<td>A. Backflow of blood into the vein during venipuncture</td>
</tr>
<tr>
<td>19. Lipemia</td>
<td>B. Breast removal</td>
</tr>
<tr>
<td>20. Lipemic</td>
<td>C. Clotted, or denoting a vessel containing a clot</td>
</tr>
<tr>
<td>21. Lymphostasis</td>
<td>D. Condition of increased lipid content in the blood</td>
</tr>
<tr>
<td>22. Mastectomy</td>
<td>E. Fainting</td>
</tr>
<tr>
<td>23. Petechiae</td>
<td>F. Hard, cord-like, and lacking resilience</td>
</tr>
<tr>
<td>24. PICC</td>
<td>G. Icterus, a condition characterized by increased bilirubin</td>
</tr>
<tr>
<td>25. Preanalytical</td>
<td>H. Normal lab test values for healthy individuals</td>
</tr>
<tr>
<td>26. Pre-examination</td>
<td>I. Peripherally inserted central catheter</td>
</tr>
<tr>
<td>27. Reference ranges</td>
<td>J. Prior to analysis</td>
</tr>
<tr>
<td>28. Reflux</td>
<td>K. Relating to the action of a particular nerve on blood vessels</td>
</tr>
<tr>
<td></td>
<td>L. Stagnation or stoppage of the normal blood flow</td>
</tr>
<tr>
<td></td>
<td>M. Stoppage or obstruction of normal lymph flow</td>
</tr>
<tr>
<td></td>
<td>N. Term used to describe serum or plasma that has a milky look</td>
</tr>
<tr>
<td></td>
<td>O. Tiny, nonraised red spots appearing on patient’s skin</td>
</tr>
<tr>
<td></td>
<td>P. Word that means the same as preanalytical</td>
</tr>
</tbody>
</table>
29. _____ Sclerosed
30. _____ Syncope
31. _____ Thrombosed
32. _____ Vasovagal
33. _____ Venous stasis

**MATCHING 9-2: PHYSIOLOGICAL EFFECT AND TEST**

Match the physiological effect to the associated test.

<table>
<thead>
<tr>
<th>Physiological Effect</th>
<th>Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Crying can increase levels</td>
<td>A. Amylase</td>
</tr>
<tr>
<td>2. Decreases with age</td>
<td>B. Bilirubin</td>
</tr>
<tr>
<td>3. Dehydration increases levels</td>
<td>C. CK</td>
</tr>
<tr>
<td>4. Elevated levels are related to jaundice</td>
<td>D. Coagulation factors</td>
</tr>
<tr>
<td>5. Fatty foods increase levels</td>
<td>E. Cortisol</td>
</tr>
<tr>
<td>6. Fever causes levels to increase</td>
<td>F. Creatinine clearance</td>
</tr>
<tr>
<td>7. Increases with altitude</td>
<td>G. IGA</td>
</tr>
<tr>
<td>8. Levels normally peak around 0800 hours</td>
<td>H. Insulin</td>
</tr>
<tr>
<td>9. Pancreatitis from steroid use increases levels</td>
<td>I. Lipids</td>
</tr>
<tr>
<td>10. Requires documentation of patient’s position during collection</td>
<td>J. Plasma renin</td>
</tr>
<tr>
<td>11. Smoking decreases levels</td>
<td>K. RBC count</td>
</tr>
<tr>
<td>12. Stays elevated for 24 hours or more after exercise</td>
<td>L. WBC count</td>
</tr>
</tbody>
</table>
MATCHING 9-3: PROBLEM SITE AND DRAWBACK

Match the problem venipuncture site to the possible drawback if a blood specimen is collected from it.

<table>
<thead>
<tr>
<th>Problem Site</th>
<th>Drawback</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. _____ Antecubital area with a large hematoma</td>
<td>A. Could mean veins are deeper than normal.</td>
</tr>
<tr>
<td>2. _____ Edematous arm</td>
<td>B. Dyes might interfere with testing.</td>
</tr>
<tr>
<td>3. _____ Mastectomy on that side of the body</td>
<td>C. Impaired circulation could affect test results.</td>
</tr>
<tr>
<td>4. _____ Obese arm</td>
<td>D. Results could be erroneous due to lymphostasis.</td>
</tr>
<tr>
<td>5. _____ Recently burned antecubital area</td>
<td>E. Site may be painful and susceptible to infection.</td>
</tr>
<tr>
<td>6. _____ Tattoo-covered arm</td>
<td>F. Skin could be injured by tourniquet application.</td>
</tr>
<tr>
<td>7. _____ Vein that feels sclerosed</td>
<td>G. Specimen could be contaminated by hemolyzed blood.</td>
</tr>
</tbody>
</table>

MATCHING 9-4: SCENARIOS AND VASCULAR ACCESS DEVICES

Match the type of equipment described in the following scenarios with the list of vascular access devices.

<table>
<thead>
<tr>
<th>Scenarios</th>
<th>Vascular Access Devices</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. _____ A nurse is collecting a blood gas specimen from tubing inserted in the underside of a patient’s left wrist on the thumb side.</td>
<td>A. Arterial line (A-line)</td>
</tr>
<tr>
<td>2. _____ A nurse is palpating an area in the patient’s upper chest. She tells the patient that she is looking for the “chamber.”</td>
<td>B. Arteriovenous (AV) shunt</td>
</tr>
<tr>
<td>3. _____ A patient in the dialysis unit has what appears to be a loop under the skin on the inside of his forearm in which the large needles connected to the dialysis tubing have been inserted.</td>
<td>C. Central venous catheter (CVC)</td>
</tr>
<tr>
<td>4. _____ There are several short lengths of capped tubing protruding from a patient’s left arm, just above the antecubital area.</td>
<td>D. Heparin lock</td>
</tr>
<tr>
<td>5. _____ There is a device inserted on the back of a patient’s arm just above the wrist. The device has a thin, rubber-like cover through which a nurse is administering fluid from a syringe.</td>
<td>E. Implanted port</td>
</tr>
<tr>
<td>6. _____ The patient is a line draw. He has three short lengths of capped tubing protruding from his chest. The nurse draws the specimen for you from one of the lengths of tubing.</td>
<td>F. Peripherally inserted central catheter (PICC)</td>
</tr>
</tbody>
</table>
### MATCHING 9-5: RISK AND PROCEDURAL ERROR

Match the risk to the procedural error involved.

<table>
<thead>
<tr>
<th>Risk</th>
<th>Procedural Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. _____ Hematoma formation</td>
<td>A. A patient is a difficult draw so the phlebotomist draws from the exact same site each time.</td>
</tr>
<tr>
<td>2. _____ Iatrogenic anemia</td>
<td>B. Blood fills the stopper end of the tube first.</td>
</tr>
<tr>
<td>3. _____ Inadvertent arterial puncture</td>
<td>C. Blood spurts into the tube after the needle is redirected multiple times.</td>
</tr>
<tr>
<td>4. _____ Infection</td>
<td>D. The needle goes through the vein.</td>
</tr>
<tr>
<td>5. _____ Nerve damage</td>
<td>E. The patient complains of great pain during a missed attempt to draw from the basilic vein.</td>
</tr>
<tr>
<td>6. _____ Reflux</td>
<td>F. The phlebotomist always wipes the alcohol dry before performing a venipuncture.</td>
</tr>
<tr>
<td>7. _____ Vein damage</td>
<td>G. Three 5-mL tubes of blood are drawn from an infant at one time.</td>
</tr>
</tbody>
</table>

### MATCHING 9-6: SENTENCE BEGINNING AND ENDING

Match the beginning of the sentence concerning causes of hemolysis with the letter of the correct sentence ending.

**Sentence Beginning**

1. Drawing blood through a _____
2. Failure to wipe away the first drop of _____
3. Forceful aspiration of _____
4. Forcing the blood _____
5. Frothing of blood _____
6. Horizontal transport of _____
7. Mixing additive tubes _____
8. Partially filling a _____
9. Pulling back the _____
10. Rough handling _____
11. Squeezing the site _____
12. Syringe transfer _____
13. Using a large volume _____
14. Using a needle with a _____

**Sentence Ending**

A. blood during a syringe draw
B. capillary blood, which can contain alcohol residue
C. caused by improper fit of the needle on a syringe
D. delay in which partially clotted blood is forced into a tube
E. during capillary specimen collection
F. during transport
G. from a syringe into an evacuated tube
H. hematoma or from a vein with a hematoma
I. normal draw sodium fluoride tube
J. plunger too quickly during a syringe draw
K. too-small diameter for venipuncture
L. tube with a small-diameter butterfly needle
M. tubes, which lets the blood slosh back and forth
N. vigorously, shaking them, or inverting them too quickly or forcefully
Labeling Exercises

LABELING EXERCISE 9-1: IDENTIFYING VENIPUNCTURE PROBLEMS

One of the following illustrations shows correct needle position. The other illustrations depict venipuncture problems. Select the corrective action required for each illustration from the list below and write the letter of the corrective action on the corresponding line. Choices may be used more than once.

Corrective Action

A. Correct needle position; blood can flow freely—no action required.
B. Discontinue the draw.
C. Disengage the tube, pull the needle back slightly, and re-engage the tube.
D. Disengage the tube, pull the needle back until only the bevel is under the skin, anchor the vein, redirect the needle, and re-engage the tube.
E. Gently push the needle forward.
F. Put on a new tube.
G. Try using a smaller-volume tube.
H. Withdraw the needle slowly until blood flow is obtained.
LABELING EXERCISE 9-2: VAD IDENTIFICATION

The following are examples of VAD placement in patients. Identify and label each one by writing the type of VAD on the line beneath it. Use the VAD full name and initials if applicable.

1. 
2. 
3. 
4. 
Knowledge Drills

KNOWLEDGE DRILL 9-1: CAUTION AND KEY POINT RECOGNITION

The following sentences are from caution and key point statements found throughout Chapter 9 of the textbook. Using the TEXTBOOK, fill in the blanks with the missing information.

1. The National Cholesterol Education Program recommends that (A) __________ profiles be collected in a consistent manner after the patient has been either (B) ____________ or ____________ quietly for a minimum of (C) ____________.

2. Never apply a (A) ____________ or (B) ____________, or perform venipuncture, on an arm with a (C) ____________.

3. The use of (A) ____________ to revive patients who have fainted can have unwanted side effects such as (B) ____________ distress in (C) ____________ individuals and is not recommended.

4. If marked or (A) ____________ occurs, or the patient asks you to remove the (B) ____________ for any reason, the venipuncture should be (C) ____________ immediately, even if there are no other signs of (D) ____________.

5. Extreme pain, a burning or (A) ____________ sensation, (B) ____________ of the arm, and pain that radiates up or down the arm are all signs of (C) ____________ involvement, and any one of them requires immediate (D) ____________ of the venipuncture.

6. Hand or fist (A) ____________ can (B) ____________ blood (C) ____________ levels up to 20%.

7. (A) ____________ is painful to the patient and can damage (B) ____________ or lead to inadvertent puncture of an (C) ____________.

8. Jaundice in a patient may indicate (A) ____________ inflammation caused by (B) ____________ B or C (C) ____________.

9. Never perform venipuncture through a (A) ____________. If there is no alternative site, perform the venipuncture (B) ____________ to the (C) ____________ to ensure the collection of (D) ____________ blood.

10. Only specially (A) ____________ personnel should access (B) ____________ to draw blood. However, the phlebotomist may assist by (C) ____________ the specimen to the appropriate (D) ____________.

KNOWLEDGE DRILL 9-2: SCRAMBLED WORDS

Unscramble the following words using the hints given in parentheses. Write the correct spelling of the scrambled word on the line next to it.

1. ajecudin ______________________ (could indicate hepatitis)
2. cimhootninecronat ______________________ (an indirect result of venous stasis)
3. ecepahiet ______________________ (a sign that the site may bleed excessively)
4. oratiecing ______________________ (as a result of treatment)
5. polsecdal ______________________ (describes a vein that has shut down)
6. psoynec ______________________ (patient reaction to fear of venipuncture)
7. rudalin ______________________ (happening daily)
8. sbla ______________________ (type of metabolic state)
9. smettmycoa ______________________ (issues with this side for a blood draw)
10. soyiteb ______________________ (could lead to difficult arm draws)
11. thrandeoyid ______________________ (decrease in total body fluid)
12. xuferl ______________________ (arm position helps avoid this)

KNOWLEDGE DRILL 9-3: HEMATOMA FORMATION

The following are six situations that can trigger hematoma formation. Fill in the blanks with the missing information.
1. The vein is ______________________ for the needle size.
2. The needle penetrates ______________________.
3. The needle is ______________________ into the vein.
4. Excessive or ______________________ is used to locate the vein.
5. The needle is removed while the ______________________.
6. ______________________ is not adequately applied following venipuncture.

KNOWLEDGE DRILL 9-4: IATROGENIC BLOOD LOSS

List four ways to minimize iatrogenic blood loss.
1. ______________________
2. ______________________
3. ______________________
4. ______________________

KNOWLEDGE DRILL 9-5: HEMOCONCENTRATION

Place a “C” in front of each sentence that describes an action that causes hemoconcentration. Place a “P” in front of each sentence that describes an action that prevents hemoconcentration.
1. ______ Allowing the patient to pump the fist
2. ______ Asking the patient to release the fist upon blood flow
3. ______ Choosing an appropriate patent vein
4. ______ Excessively massaging the area when locating a vein
5. ______ Redirecting the needle multiple times in search of a vein
6. ______ Releasing the tourniquet within 1 minute
KNOWLEDGE DRILL 9-6: SERUM APPEARANCE

Color the serum in the numbered aliquot tubes according to the appearance listed by tube number below.

**Serum Appearance**
1. Icteric
2. Lipemic
3. Mild hemolysis
4. Moderate hemolysis
5. Gross hemolysis
6. Normal
Skills Drills

SKILLS DRILL 9-1: REQUISITION ACTIVITY

Instructions: Answer the following questions concerning the test requisition shown below.

1. Identify two physiological variables that affect Hgb levels.

2. If this patient’s bilirubin level is high, how might it affect the patient’s appearance?

3. How will the phlebotomist obtain this specimen?

4. Identify the tube required for each test.

---

Any Hospital USA
1123 West Physician Drive
Any Town USA

Laboratory Test Requisition

PATIENT INFORMATION:

Name: Smith Jane R
Identification Number: 09365784 Birth Date: 06/21/63
Referring Physician: Coleman
Date to be Collected: 03/11/2011 Time to be Collected: 0600
Special Instructions: Line draw only

TEST(S) REQUIRED:

- NH4 – Ammonia
- Bili – Bilirubin, total & direct
- BMP – basic metabolic panel
- BUN - Blood urea nitrogen
- Lytes – electrolytes
- CBC – complete blood count
- Chol – cholesterol
- ESR – erythrocyte sed rate
- EtOH - alcohol
- D-dimer

- Gluc – glucose
- Hgb – hemoglobin
- Lact – lactic acid/lactate
- Pt. Ct. – platelet count
- PT – prothrombin time
- PTT – partial thromboplastin time
- RPR – rapid plasma reagin
- T&S – type and screen
- PSA – prostate specific antigen

Other
**SKILLS DRILL 9-2: WORD BUILDING**

Divide each of the words below into all of its elements (parts): prefix (P), word root (WR), combining vowel (CV), and suffix (S). Write the word part, its definition, and the meaning of the word on the corresponding lines. If the word does not have a particular element, write NA (not applicable) in its place.

**Example: Lymphostasis**

<table>
<thead>
<tr>
<th>Elements</th>
<th>Definitions</th>
<th>Meaning: stopping lymph flow</th>
</tr>
</thead>
<tbody>
<tr>
<td>lymph</td>
<td>o</td>
<td>stasis</td>
</tr>
</tbody>
</table>

1. Arteriovenous

<table>
<thead>
<tr>
<th>Elements</th>
<th>Definitions</th>
<th>Meaning:</th>
</tr>
</thead>
<tbody>
<tr>
<td>WR</td>
<td>CV</td>
<td></td>
</tr>
</tbody>
</table>

2. Hemolysis

<table>
<thead>
<tr>
<th>Elements</th>
<th>Definitions</th>
<th>Meaning:</th>
</tr>
</thead>
<tbody>
<tr>
<td>P</td>
<td>WR</td>
<td>CV</td>
</tr>
</tbody>
</table>

3. Intravenous

<table>
<thead>
<tr>
<th>Elements</th>
<th>Definitions</th>
<th>Meaning:</th>
</tr>
</thead>
<tbody>
<tr>
<td>P</td>
<td>WR</td>
<td>CV</td>
</tr>
</tbody>
</table>

4. Lipemia

<table>
<thead>
<tr>
<th>Elements</th>
<th>Definitions</th>
<th>Meaning:</th>
</tr>
</thead>
<tbody>
<tr>
<td>P</td>
<td>WR</td>
<td>CV</td>
</tr>
</tbody>
</table>

5. Sclerosis

<table>
<thead>
<tr>
<th>Elements</th>
<th>Definitions</th>
<th>Meaning:</th>
</tr>
</thead>
<tbody>
<tr>
<td>P</td>
<td>WR</td>
<td>CV</td>
</tr>
</tbody>
</table>

6. Venostasis

<table>
<thead>
<tr>
<th>Elements</th>
<th>Definitions</th>
<th>Meaning:</th>
</tr>
</thead>
<tbody>
<tr>
<td>P</td>
<td>WR</td>
<td>CV</td>
</tr>
</tbody>
</table>
SKILLS DRILL 9-3: VENIPUNCTURE BELOW AN IV (text Procedure 9-1)

Fill in the blanks with the missing information.

Steps

1. Ask the patient’s nurse to turn off the IV for at least (A) __________ prior to collection.

2. Apply the tourniquet (D) __________ to the IV.

3. Select a venipuncture site (F) __________ to the IV.

4. Perform the venipuncture in a different (J) ________________ if possible.

5. Ask the nurse to (M) ________________ after the specimen has been collected.

6. Document that the specimen was collected (P) ________________ an IV, indicate the (Q) ________________ in the IV, and identify which (R) ________________.

Explanation/Rationale

A phlebotomist is not qualified to (B) __________ IV __________. Turning off the IV for (C) __________ allows IV fluids to dissipate from the area.

Avoids (E) __________ the IV.

Venous blood flows (G) ________________ __________. Drawing (H) __________ an IV affords the best chance of obtaining blood that is free of (I) ________________.

IV fluids can be present (K) ________________ because of (L) __________ and may still be present after the IV is shut off because of poor venous circulation.

IV flow rates must be (N) __________ and starting or adjusting them is not part of a phlebotomist’s (O) ________________.

This aids (S) ________________ and the patient’s physician in the event that test (T) ________________.
**SKILLS DRILL 9-4: FAINTING PROCEDURE** (text Procedure 9-2)

Fill in the blanks with the missing information.

**Steps**

1. Release the (A) _______________ and remove and discard the needle as quickly as possible.

2. Apply pressure to the site while having the patient lower the (D) _______________ and breathe deeply.

3. (G) _______________ to the patient.

4. Physically (J) _______________ the patient.

5. Ask (M) _______________ and explain what you are doing if it is necessary to loosen a tight collar or tie.

6. Apply a (P) _______________ compress or wet washcloth to the (Q) _______________ and _______________.

7. Have someone stay with the patient until (S) _______________ is complete.

8. Call (V) _______________ personnel if the patient does not respond.

9. (X) _______________ the incident according to facility protocol.

**Explanation/Rationale**

Discontinuing the draw and discarding the needle protects the (B) _______________ from (C) _______________, should the patient faint. Pressure must be applied to prevent bleeding or bruising. Lowering the (E) _______________ and breathing deeply helps get oxygenated blood to the (F) _______________.

Diverts patient’s attention, helps keep the patient (H) _______________, and aids in assessing the patient’s (I) _______________.

Prevents (K) _______________ in case of (L) _______________.

Avoids (N) _______________ of actions that are (O) _______________ _______________ to hasten recovery.

Prevents patient from (T) _______________ too soon and possibly causing (U) _______________.

Emergency medicine is not in the phlebotomist’s (W) _______________ of _______________.

(Y) _______________ issues could arise and further (Z) _______________ is essential at that time.
ACROSS
1. Result of damaged RBCs
4. Another name for indwelling line (abbrev.)
7. Possible result of mastectomy
9. Medical term for fainting
10. Having a 24-hour cycle
12. Describes blood loss due to testing
13. Broviac or Hickman (abbrev.)
14. Surgical connection of an artery and a vein
16. Excess tissue fluid
17. Describes a clotted vein
18. Increased temperature
20. Resting metabolic state
21. Intravenous line (abbrev.)
22. Fusion of an artery and a vein
23. Arteriovenous (abbrev.)
24. Trauma-related complication
25. Usually precedes vomiting
26. Preferred ______ is “fasting”
28. Distinct buzzing VAD sensation

DOWN
1. Result of decreased plasma volume
2. Extreme chubbiness
3. Brand of elastic pressure wrap
4. Cephalic or basilic
5. Pertaining to increased bilirubin
6. Disease caused by HIV
7. Arterial line (abbrev.)
8. Most common phlebotomy complication
9. Causes turbid serum
10. Stagnation of fluid
11. Relating to a vein
12. To search for a vein
13. Can cause an allergic reaction
14. Can be the result of nausea
15. Value can change 50% from A.M. to P.M.
Chapter Review Questions

1. The medical term for fainting is:
   a. edematous.
   b. exsanguination.
   c. reflux.
   d. syncope.

2. According to CAP guidelines, drugs that interfere with blood tests should be stopped:
   a. 1 to 4 hours before the test.
   b. 4 to 24 hours prior to the test.
   c. 24 to 48 hours prior to the test.
   d. 48 to 72 hours prior to the test.

3. Which of the following tests is affected the most if collected from a crying infant?
   a. Bilirubin
   b. Cholesterol
   c. Lead level
   d. WBC count

4. A hematoma may result from:
   a. inadequate site pressure applied after a venipuncture.
   b. needle penetration through the back wall of the vein.
   c. using a needle that is too large for the size of the vein.
   d. All of the above can result in hematoma formation.

5. Results of this test have a direct correlation with the patient’s age.
   a. Blood culture
   b. Creatinine clearance
   c. Glucose
   d. Hemoglobin

6. Which of the following specimen conditions would lead you to suspect that the patient was not fasting when it was collected?
   a. Cloudy white serum
   b. Pale-yellow plasma
   c. Pink to reddish plasma
   d. Yellowish brown serum

7. A phlebotomist needs to collect a plasma specimen for a coagulation test. The patient has an IV in the left arm near the wrist and a hematoma in the antecubital area of the right arm. Which of the following is the best place to collect the specimen?
   a. Above the IV
   b. From the IV after shutting it off for 2 minutes
   c. Distal to the hematoma
   d. All of the above are acceptable collection sites

8. A patient’s arm is in anatomical position. There appears to be a loop under the skin between the wrist and the elbow. You feel a buzzing sensation when you touch it. What you are most likely feeling is a:
   a. AV graft.
   b. implanted port.
   c. PICC.
   d. sclerosed vein.
9. While you are in the middle of drawing a blood specimen, your patient starts to faint. The first thing you should do is:
   a. apply a cold compress directly to the patient’s forehead.
   b. grab ammonia inhalant and wave it near the patient’s nose.
   c. quickly release the tourniquet and remove the needle.
   d. tell the patient to lower the head and breathe deeply.

10. A patient has had a mastectomy on the left side and has an IV midway down the right arm. Where is the best place to perform a venipuncture?
   a. Above the IV on the right arm
   b. Below the IV on the right arm
   c. In the left antecubital area
   d. In the left hand or wrist

11. Blood loss to a point where life cannot be sustained is called:
   a. diurnal variation.
   b. exsanguination.
   c. iatrogenic anemia.
   d. vasovagal syncope.

12. Which of the following specimens would most likely be rejected for testing?
   a. A hemolyzed potassium specimen
   b. An icteric bilirubin specimen
   c. A nonfasting glucose specimen
   d. An underfilled serum tube

13. Which of the following is a clue that you have accidentally punctured an artery instead of a vein?
   a. The blood is dark bluish red.
   b. The blood spurts into the tube.
   c. The patient feels great pain.
   d. All of the above are clues.

14. The serum or plasma of a hemolyzed specimen would most likely look:
   a. cloudy or turbid.
   b. pale yellow.
   c. pinkish to red.
   d. yellowish brown.

15. Underfilling this tube will most likely result in a hemolyzed specimen.
   a. EDTA tube
   b. Light-blue top
   c. Gray top
   d. SST

16. Which activity can contaminate a blood specimen and affect the testing performed on it?
   a. Cleaning the site with alcohol before drawing an ETOH specimen.
   b. Collecting blood cultures before the povidone–iodine is totally dry.
   c. Using povidone–iodine to clean the site prior to a finger puncture.
   d. All of the above activities can affect testing done on the specimen.

17. Which activity is least likely to lead to failure to draw blood?
   a. Choosing a vein that has patency
   b. Leaving the tourniquet on too long
   c. Loosely anchoring the vein
   d. Using a tube that was dropped
18. The best way to keep a vein from rolling is to:
   a. insert the needle at a 45-degree angle.
   b. make certain to anchor it well.
   c. tie the tourniquet very tight.
   d. use a large-diameter needle.

19. You insert the needle in a patient’s arm and properly engage the tube. No blood flows into the tube. You make
    subtle needle adjustments and there is still no blood flow. Which of the following is the best thing to do next?
    a. Discontinue the draw and try somewhere else.
    b. Keep redirecting the needle until you hit a vein.
    c. Lift up on the needle to create a steeper angle.
    d. Try a new tube in case it is a vacuum problem.

20. Which of the following is most likely to affect test results?
    a. Edema
    b. Petechiae
    c. Reflux
    d. Syncope
CASE STUDIES

Case Study 9-1  Problem Sites, Complications, and Procedural Errors

Erica is a recent phlebotomy program graduate who was hired less than a month ago by a major hospital in her first job as a phlebotomist. Her first 3 months of employment are a probationary period, and she is determined to do a good job. This morning she has been asked to collect a stat CBC and electrolytes from a patient in an intensive care unit. The patient is responsive and cooperative but has difficulty breathing. The patient’s nurse mentions that she will hook up the patient’s oxygen therapy as soon as the phlebotomist is finished with him. He has an IV in his left hand. Erica palpates the right antecubital area. She can feel the median cubital vein but it is deep. The basilic vein is visible and prominent, so she decides to use it to collect the specimen. When she inserts the needle into the arm, the vein rolls and her needle ends up beside the vein and slightly under it. She redirects the needle and the vein rolls again. The patient winces in pain but says nothing. Noticing the look of pain on the patient’s face, Erica asks him if it hurts. The patient says yes and tells her that the pain is radiating down his arm and his fingers are tingling. Erica asks him if he would like her to remove the needle. The patient replies “No, you’ve got to get the specimen,” so Erica tries again to redirect the needle. Finally, blood spurts into the tube and a hematoma starts to form quickly. At first Erica thinks that she may have hit an artery, but the specimen is normal in color so Erica dismisses the thought. She quickly collects the specimens, covers the site with gauze and asks the patient to hold pressure while she labels the tubes. When she has finished she thanks the patient and delivers the stat specimens to the laboratory.

QUESTIONS

1. What site selection issues were associated with the collection of this specimen?
2. Were the site selection issues handled properly? Explain why or why not.
3. What complications and procedural errors were involved?
Case Study 9-2  Specimen Quality Concerns

Ray, a newly hired phlebotomist who has just recently finished phlebotomy training, is preparing to draw the last GTT specimen on an outpatient. This is the first GTT he has performed without supervision, and he is proud of how well he has done. The patient has good veins in both arms so he has been alternating arms for the blood draws. The patient is anxious to go home and Ray is in a hurry to go on break, so he quickly selects a vein, performs a successful venipuncture, and collects the required gray-top tube. He finishes the draw and quickly shakes the tube. Later, as he starts to label it, he notices that the tube is only half full. He has been allowed to submit other partial tubes without a problem, so he shrugs his shoulders and proceeds to bandage and then dismiss the patient. He submits the specimen to the lab and goes on break. When he returns he is informed that the last GTT specimen was hemolyzed and unsuitable for testing, so that the test will have to be repeated. Ray is completely surprised by this because there were no problems with the draw. Now Ray has to call the patient and reschedule the test. The patient is understandably upset.

QUESTIONS

1. What errors did Ray make that could have caused hemolysis of the specimen?
2. What could Ray have done differently that might have prevented the hemolysis?
3. What other error did Ray make?
4. What could Ray have done differently to prevent the error in number 3 above?