Matching

Use choices only once unless otherwise indicated.

**MATCHING 11-1: KEY TERMS AND DESCRIPTIONS**

Match the key term with the best description.

**Key Terms (1–18)**

<table>
<thead>
<tr>
<th>Number</th>
<th>Term</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>AABB</td>
<td>A. Abbreviation for ethanol</td>
</tr>
<tr>
<td>2.</td>
<td>ACT</td>
<td>B. Ability to be favorably mixed together</td>
</tr>
<tr>
<td>3.</td>
<td>Aerobic</td>
<td>C. Activated clotting time</td>
</tr>
<tr>
<td>4.</td>
<td>Anaerobic</td>
<td>D. Antimicrobial removal device</td>
</tr>
<tr>
<td>5.</td>
<td>ARD</td>
<td>E. Bacteria in the blood</td>
</tr>
<tr>
<td>6.</td>
<td>autologous</td>
<td>F. Blood alcohol concentration</td>
</tr>
<tr>
<td>7.</td>
<td>BAC</td>
<td>G. Donating blood for one’s own use.</td>
</tr>
<tr>
<td>8.</td>
<td>Bacteremia</td>
<td>H. Fastidious antimicrobial neutralization</td>
</tr>
<tr>
<td>9.</td>
<td>BNP</td>
<td>I. Fever of unknown origin</td>
</tr>
<tr>
<td>10.</td>
<td>Chain of custody</td>
<td>J. Hormone detected in pregnancy test</td>
</tr>
<tr>
<td>11.</td>
<td>Compatibility</td>
<td>K. Instrument’s electronic QC check</td>
</tr>
<tr>
<td>12.</td>
<td>CRP</td>
<td>L. Measurement for congestive heart failure</td>
</tr>
<tr>
<td>13.</td>
<td>EQC</td>
<td>M. Nonspecific marker for inflammation</td>
</tr>
<tr>
<td>14.</td>
<td>ETOH</td>
<td>N. Organization that sets guidelines for Blood Donor Centers</td>
</tr>
<tr>
<td>15.</td>
<td>FAN</td>
<td>O. Special protocol for forensic specimen collections</td>
</tr>
<tr>
<td>16.</td>
<td>FUO</td>
<td>P. Test to diagnose carbohydrate metabolism problems</td>
</tr>
<tr>
<td>17.</td>
<td>GTT</td>
<td>Q. With air</td>
</tr>
<tr>
<td>18.</td>
<td>HCG</td>
<td>R. Without air</td>
</tr>
</tbody>
</table>

**Key Terms (19–37)**

<table>
<thead>
<tr>
<th>Number</th>
<th>Term</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>19.</td>
<td>Hypoglycemia</td>
<td>A. After a meal</td>
</tr>
<tr>
<td>20.</td>
<td>Hyperkalemia</td>
<td>B. Decreased blood sugar levels</td>
</tr>
<tr>
<td>21.</td>
<td>Hypernatremia</td>
<td>C. Heart muscle protein elevated in 3 to 6 hours</td>
</tr>
<tr>
<td>22.</td>
<td>iCa2+</td>
<td>D. Heart muscle protein that may be elevated 14 days</td>
</tr>
<tr>
<td>23.</td>
<td>INR</td>
<td>E. Highest serum drug concentration anticipated</td>
</tr>
<tr>
<td>24.</td>
<td>K+</td>
<td>F. Increased blood potassium levels</td>
</tr>
<tr>
<td>25.</td>
<td>Lactate</td>
<td>G. Increased blood sodium levels</td>
</tr>
<tr>
<td>26.</td>
<td>Lookback</td>
<td>H. Intensive insulin therapy for glucose control</td>
</tr>
<tr>
<td>27.</td>
<td>Lysis</td>
<td>I. Ionized form of calcium</td>
</tr>
<tr>
<td>28.</td>
<td>NIDA</td>
<td>J. Lowest serum drug concentration expected</td>
</tr>
<tr>
<td>29.</td>
<td>Peak level</td>
<td>K. Microorganism and toxins in the blood</td>
</tr>
<tr>
<td>30.</td>
<td>POCT</td>
<td>L. National Institute on Drug Abuse</td>
</tr>
<tr>
<td></td>
<td></td>
<td>M. Program to trace blood unit components to donor</td>
</tr>
<tr>
<td></td>
<td></td>
<td>N. Rupturing, as in the bursting of a red blood cell</td>
</tr>
<tr>
<td></td>
<td></td>
<td>O. Standardized form of PT results</td>
</tr>
<tr>
<td></td>
<td></td>
<td>P. Testing performed at the patient’s side</td>
</tr>
</tbody>
</table>
Chapter 11: Special Collections and Point-of-Care Testing

31. _____ PP
32. _____ Septicemia
33. _____ TDM
34. _____ TGC
35. _____ TnI
36. _____ TnT
37. _____ Trough level

Q. The mineral potassium
R. Therapeutic drug levels collected at specific times
S. This analyte level marks severity of metabolic acidosis

MATCHING 11-2: POCT TESTS AND INSTRUMENTS USED FOR TESTING

Match the following tests to the POCT instruments (instruments can only be used once).

<table>
<thead>
<tr>
<th>POC Tests</th>
<th>POCT Instruments</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. CK-MB</td>
<td>1. _____ Verify Now</td>
</tr>
<tr>
<td>B. Lactate</td>
<td>2. _____ Quidel Quick Vue</td>
</tr>
<tr>
<td>C. Glycosylated Hb</td>
<td>3. _____ Precision XceedPro</td>
</tr>
<tr>
<td>D. Hemoglobin</td>
<td>4. _____ StatSpin CritSpin</td>
</tr>
<tr>
<td>E. Pco2</td>
<td>5. _____ Hemoccult II Sensa</td>
</tr>
<tr>
<td>F. PT</td>
<td>6. _____ CARDIAC T Rapid Assay</td>
</tr>
<tr>
<td>G. TnT</td>
<td>7. _____ Cholestech LDX</td>
</tr>
<tr>
<td>H. BUN</td>
<td>8. _____ Stratus CS</td>
</tr>
<tr>
<td>I. CRP</td>
<td>9. _____ GEM Premier 4000</td>
</tr>
<tr>
<td>J. Hematocrit</td>
<td>10. _____ HemoCue HB 201+</td>
</tr>
<tr>
<td>K. β-ketone</td>
<td>11. _____ DCA Vantage</td>
</tr>
<tr>
<td>L. UA</td>
<td>12. _____ Triage Cardiac Panel</td>
</tr>
<tr>
<td>M. Guaiac</td>
<td>13. _____ CoaguChek XS</td>
</tr>
<tr>
<td>N. HCG</td>
<td>14. _____ i-STAT</td>
</tr>
<tr>
<td>O. LDL</td>
<td>15. _____ ABL80</td>
</tr>
<tr>
<td>P. Platelet function</td>
<td>16. _____ Clinitek Advantus</td>
</tr>
</tbody>
</table>

MATCHING 11-3: SPECIAL TEST COLLECTION, EQUIPMENT, OR PROCEDURE

Match the following tests with the special equipment or procedure involved. (Answers can be used only once.)

<table>
<thead>
<tr>
<th>Special Test</th>
<th>Special Handling, Equipment, or Procedure</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. _____ 2-hour PP</td>
<td>A. Draw in trace element–free tube.</td>
</tr>
<tr>
<td>2. _____ Blood alcohol</td>
<td>B. Involves intradermal injection of diluted antigen.</td>
</tr>
<tr>
<td>3. _____ Blood culture</td>
<td>C. May require a proctor present at the time of collection.</td>
</tr>
<tr>
<td>4. _____ Blood type and screen</td>
<td>D. May require photo identification before collection.</td>
</tr>
<tr>
<td>5. _____ RNA</td>
<td>E. Requires serial collection of blood specimens at specific times.</td>
</tr>
<tr>
<td>6. _____ GTT</td>
<td>F. Patient ID procedures are extra strict.</td>
</tr>
<tr>
<td>7. _____ Paternity testing</td>
<td>G. Requires a 9-to-1 ratio of blood to anticoagulant in the collection tube.</td>
</tr>
<tr>
<td></td>
<td>H. Skin antisepsis is critical to accurate test results.</td>
</tr>
<tr>
<td></td>
<td>I. Special chain of custody protocol required.</td>
</tr>
</tbody>
</table>
8. _____ Polycythemia
9. _____ PT
10. _____ TB test
11. _____ Urine drug screen
12. _____ Zinc

J. Specimen is collected at specific time after eating.
K. Treatment often involves removal of units of blood.
L. If not tested immediately, must be collected with a stabilizing reagent.

Labeling Exercises

LABELING EXERCISE 11-1: POC INSTRUMENTS AND TESTS

Label the photo of each of the following POC instruments with the name of the instrument and the test that it is used to measure. Choose from the following list of tests.

Instrument That Can Measure

ACT
b-ketones
Blood gases
BNP
Creatinine
HbA1c
hCG
HDL
Hematocrit
Hemoglobin
Lactate
Platelet function

1. name: _______________________________ test: _______________________________
Chapter 11: Special Collections and Point-of-Care Testing

2. name: ___________________________  test: ___________________________

3. name: ___________________________  test: ___________________________

4. name: ___________________________  test: ___________________________
5. name: ___________________________ test: ___________________________

6. name: ___________________________ test: ___________________________
7. name: ____________________________  test: ____________________________

8. name: ____________________________  test: ____________________________
9. name: _______________________________  test: ______________________________________

10. name: _______________________________  test: _______________________________________
LABELING EXERCISE 11-2: ONE BBID SYSTEM

You are a new phlebotomist who is asked to get blood from a patient for a crossmatch STAT. Before leaving the laboratory with the requisition, the MT in the blood bank gives you a FlexiBlood form and band to use in collecting the specimen. When you get to the floor, you realize that you have several questions on how to use this form. Fortunately, adequate instructions for you to follow are given on the front of the form.

1. Which of the following is the unique BBID number?

2. Where does the preprinted patient information go?

3. Which part is filled in, removed, and placed on the band?

4. Which one is the label for the specimen tube?

5. What bar-code labels are to be put on the units in the laboratory?
Knowledge Drills

KNOWLEDGE DRILL 11-1: CAUTION AND KEY POINT RECOGNITION

Instructions: The following sentences are taken from caution and key point statements found throughout the chapter. Using the TEXTBOOK, fill in the blanks with the missing information.

1. Blood cultures are typically ordered immediately (A) ______________ or (B) ______________
   (C) ______________ spikes when bacteria are most likely to be present. (D) ______________ collection is
   important, but (E) ______________ is more important than (F) ______________ in detecting the causative
   agent of septicemia.

2. When a (A) ______________ is used to collect the blood, the (B) ______________ bottle is filled first. When
   a (C) ______________ is used, it is preferable to fill the (D) ______________ bottle first because
   (E) ______________ in the tubing will be drawn into it along with the blood.

3. According to the CLSI, (A) ______________ (B) ______________ is the recommended blood
   culture site disinfectant for (C) ______________ 2 months and older and patients with (D) ______________
   sensitivity.

4. Blood culture specimens are always collected (A) ______________ in the order of draw to prevent
   (B) ______________ from other (C) ______________.

5. The practice of changing (A) ______________ prior to this transferring blood from a syringe is no longer
   (B) ______________. Several recent studies have shown that (C) ______________ needles has little
   (D) ______________ on reducing (E) ______________ rates and may actually (F) ______________
   risk of (G) ______________ injury to the phlebotomist.

6. If the patient (A) ______________ during the GTT procedure, his or her (B) ______________ must be
   consulted to determine if the test should be (C) ______________.

7. ______________ tubes are preferred for blood alcohol specimens because of the (B) ______________ nature
   of (C) ______________ tubes.

8. Regulatory (A) ______________ and the (B) ______________ recommend that a person receive
   (C) ______________ authorization to perform (D) ______________ glucose testing only after
   completing (E) ______________ training in facility-established procedures, including (F) ______________ and
   (G) ______________.

9. ______________ should be repeated if the analyzer is (B) ______________, the battery is
   (C) ______________ or patient results or analyzer functioning are (D) ______________.

10. A (A) ______________ (B) ______________ is also called a (C) ______________ test after the purified
    (D) ______________ derivative used in the test.

11. All (A) ______________ tubes must be (B) ______________ inverted (C) ______________ to
    (D) ______________ times immediately after collection to avoid (E) ______________, which can
    (F) ______________ test results.

12. When blood cultures from patients on (A) ______________ therapy are ordered, they should be collected
    when the (B) ______________ or other such drugs are at their (C) ______________ concentration.
KNOWLEDGE DRILL 11-2: SCRAMBLED WORDS

Unscramble the following words using the hints given in parenthesis and the letters that have been placed in the correct boxes. Finish writing the correct spelling of the scrambled word in the corresponding box.

1. ampicestie (microbes in the bloodstream)

   ______  t  e  i

2. arcle (throw this tube away)

   ______

3. ayetprint (test to identify a father)

   ______  t  r

4. cethierput (beneficial)

   ______  h  a  e

5. eclotrane (capacity to endure without ill effects)

   ______  e  e

6. gloxticooy (the study of poisons)

   ______  i  o

7. guloosotau (donor and recipient are the same)

   ______  u  l  s

8. laedslogycyt (sugar chemically linked to protein)

   ______  y  s  t

9. ralispopdant (after eating)

   ______  t  r  a

10. spitansesi (prevention of infection by inhibiting microbes)

    ______  i  s  s
KNOWLEDGE DRILL 11-3: TRUE/FALSE

The following statements are all false. Circle the one or two words that make the statement false and write the correct word(s) that would make the statement true in the space provided.

1. Blood bank tests require the collection of one or more gray or pink top EDTA tubes.
2. For FUO, two to three cultures should be collected, one right after another from the same sites.
3. The same methods for blood culture skin antisepsis for adults apply to pediatric patients unless the antiseptic is Chloroprep.
4. To minimize the risk of contamination by skin flora, the collection sites require a 15 to 20 second friction scrub to get to the bacteria beneath the dead skin cells onto the surface of the arm.
5. When a test for lead is ordered, the blood specimen must be sent for testing immediately or collected in a special stabilizing reagent.
6. When a trace element test is ordered, it is best to draw it last if using a needle/tube assembly.
7. Coagulation specimens drawn through VADs require a discard volume of blood that is ten times the dead-space volume of the tubing, approximately 5 mL.
8. A GTT patient is not allowed to drink water or chew gum, as these activities stimulate the digestive process and may cause erroneous test results.
9. Urine samples are preferred for paternity testing; however, buccal swabs are increasingly being used.
10. Drug screening tests are typically performed on saliva rather than blood because it is easy to obtain and a wide variety of drugs or their metabolites can be detected in urine for a longer period of time.

KNOWLEDGE DRILL 11-4: GLUCOSE TOLERANCE TEST (GTT)

Background: A glucose tolerance test (GTT) is used to diagnose carbohydrate metabolism problems. The major carbohydrate in the blood is glucose, the body’s source of energy. The hormone insulin, produced by the pancreas, is primarily responsible for regulating blood glucose levels. The GTT evaluates insulin response to a measured dose of glucose by recording glucose levels on specimens collected at specific time intervals. Results are plotted on a graph, creating what is referred to a GTT curve.

Instructions: The fasting blood glucose for a GTT was collected from a patient at 05:00 hours. The blood was tested and the value was normal. The patient was given the glucose drink at 05:25 hours and finished drinking it at 05:30 hours.

1. Fill in the rest of the GTT collection times in the table below.
2. Using the collection times and the results below, graph the glucose absorption curve.
3. Based on Figure 11–12 and GTT curves in Chapter 11, check which of the following is correct: This graph is _____________ normal or _____________ abnormal.

<table>
<thead>
<tr>
<th>Timing of GTT</th>
<th>Collection Time</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fasting</td>
<td>05:00</td>
<td>75 mg/dL</td>
</tr>
<tr>
<td>0.5 hour</td>
<td></td>
<td>250 mg/dL</td>
</tr>
<tr>
<td>1.0 hour</td>
<td></td>
<td>200 mg/dL</td>
</tr>
<tr>
<td>2.0 hours</td>
<td></td>
<td>175 mg/dL</td>
</tr>
<tr>
<td>3.0 hours</td>
<td></td>
<td>150 mg/dL</td>
</tr>
</tbody>
</table>
KNOWLEDGE DRILL 11-5: EXAMPLES OF DRUGS NEEDING THERAPEUTIC MONITORING AND THEIR USE

Instructions: Match each DRUG CATEGORY in the middle column below with an EXAMPLE and USE by drawing an arrow between the columns to the appropriate answer. Use a different-colored pen or pencil for each arrow. Answers can be used only once.

<table>
<thead>
<tr>
<th>Drug Example</th>
<th>Drug Category</th>
<th>Drug Usage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amikacin</td>
<td>Bronchodilators</td>
<td>Epilepsy</td>
</tr>
<tr>
<td>Methotrexate</td>
<td>Protease inhibitors</td>
<td>Bipolar disorder</td>
</tr>
<tr>
<td>Tegretol</td>
<td>Chemotherapy drugs</td>
<td>Asthma</td>
</tr>
<tr>
<td>Doxepin</td>
<td>Psychiatric drugs</td>
<td>Psoriasis</td>
</tr>
<tr>
<td>Theophylline</td>
<td>Antibiotics and Antifungals</td>
<td>Autoimmune disorders</td>
</tr>
<tr>
<td>Digitoxin</td>
<td>Cardiac drugs</td>
<td>Angina</td>
</tr>
<tr>
<td>Cyclosporine</td>
<td>Anticonvulsants</td>
<td>HIV/AIDS</td>
</tr>
<tr>
<td>Atazanavir</td>
<td>Immunosuppressants</td>
<td>Resistant infections</td>
</tr>
</tbody>
</table>
Skills Drills

SKILLS DRILL 11-1: REQUISITION ACTIVITY

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

1. How many BC media bottles will be needed to complete this order?

2. If the physician wants these blood cultures performed as quickly as possible, how many BCs can be drawn at the same time and from where?

3. Describe the special collection technique that must be used before obtaining these samples.

4. To be more efficient, should the phlebotomist ask the nurse to collect it from the heparin lock that is in the right forearm? Explain.

---

Any Hospital USA
1123 West Physician Drive
Any Town USA

Laboratory Test Requisition

PATIENT INFORMATION:

Name: Smith George  L
Identification Number: 09365784  Birth Date: 06/21/75
Referring Physician: Hurstmatson
Date to be Collected: 05/20/15  Time to be Collected: STAT
Special Instructions: need to start antibiotics ASAP

TEST(S) REQUIRED:

___ NH₄ – Ammonia  ___ Gluc – glucose
___ Bill – Bilirubin, total & direct  ___ Hgb – hemoglobin
___ BMP – basic metabolic panel  ___ Lact – lactic acid/lactate
___ BUN – Blood urea nitrogen  ___ Plt. Ct. – platelet count
___ Lytes – electrolytes  ___ PT – prothrombin time
___ CBC – complete blood count  ___ PTT – partial thromboplastin time
___ Chol – cholesterol  ___ RPR – rapid plasma reagin
___ ESR – erythrocyte sed rate  ___ T&S – type and screen
___ EtOH - alcohol  ___ PSA – prostate specific antigen
___ D-dimer  Other blood cultures X 2
**SKILLS DRILL 11-2: WORD BUILDING** (See Chapter 4, Medical Terminology)

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 and its definition on the corresponding lines. Write the general meaning of the word in the space provided. If the word does not have a particular element, write NA (not applicable) in its place.

**Example:** thyrotoxicosis

<table>
<thead>
<tr>
<th>Elements</th>
<th>P</th>
<th>WR</th>
<th>CV</th>
<th>S</th>
</tr>
</thead>
<tbody>
<tr>
<td>thyrotoxicosis.</td>
<td>thyr</td>
<td></td>
<td></td>
<td>toxic</td>
</tr>
</tbody>
</table>

Meaning: abnormal condition of a toxic thyroid gland

1. bacteremia

<table>
<thead>
<tr>
<th>Elements</th>
<th>P</th>
<th>WR</th>
<th>CV</th>
<th>S</th>
</tr>
</thead>
<tbody>
<tr>
<td>bacteremia</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Meaning: 

2. hypoglycemic

<table>
<thead>
<tr>
<th>Elements</th>
<th>P</th>
<th>CV</th>
<th>WR</th>
<th>S</th>
</tr>
</thead>
<tbody>
<tr>
<td>hypoglycemic</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Meaning: 

3. anaerobic

<table>
<thead>
<tr>
<th>Elements</th>
<th>P</th>
<th>CV</th>
<th>WR</th>
<th>S</th>
</tr>
</thead>
<tbody>
<tr>
<td>anaerobic</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Meaning: 

4. antibiotic

<table>
<thead>
<tr>
<th>Elements</th>
<th>P</th>
<th>CV</th>
<th>WR</th>
<th>S</th>
</tr>
</thead>
<tbody>
<tr>
<td>antibiotic</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Meaning: 

5. antimicrobial

<table>
<thead>
<tr>
<th>Elements</th>
<th>P</th>
<th>CV</th>
<th>WR</th>
<th>S</th>
</tr>
</thead>
<tbody>
<tr>
<td>antimicrobial</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Meaning: 

6. gastrointestinal

<table>
<thead>
<tr>
<th>Elements</th>
<th>WR</th>
<th>CV</th>
<th>WR</th>
<th>S</th>
</tr>
</thead>
<tbody>
<tr>
<td>gastrointestinal</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Meaning: 

7. amniocentesis

<table>
<thead>
<tr>
<th>Elements</th>
<th>P</th>
<th>WR</th>
<th>CV</th>
<th>S</th>
</tr>
</thead>
<tbody>
<tr>
<td>amniocentesis</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Meaning: 

---
SKILLS DRILL 11-3: BLOOD CULTURE SPECIMEN COLLECTION

Instructions: Match the rationale with the corresponding step in the procedure.

<table>
<thead>
<tr>
<th>Procedure Step</th>
<th>Rationale</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. _____ Identify venipuncture site and release tourniquet.</td>
<td>A. Antisepsis does not occur instantly.</td>
</tr>
<tr>
<td>2. _____ Aseptically select and assemble equipment.</td>
<td>B. Notation of site location is necessary because there may be an isolated infection in that area.</td>
</tr>
<tr>
<td>3. _____ Perform friction scrub as prescribed.</td>
<td>C. Ensuring antiseptic technique and sterility of the site is critical to accurate diagnosis.</td>
</tr>
<tr>
<td>4. _____ Allow site to air-dry.</td>
<td>D. The CLSI standard states that the tourniquet should not be left on longer than 1 minute.</td>
</tr>
<tr>
<td>5. _____ Cleanse the culture bottle stoppers while the site is drying.</td>
<td>E. Inoculation of the medium can occur directly into the bottle or after collection when a syringe is used.</td>
</tr>
<tr>
<td>6. _____ Mark the minimum and maximum fill on the culture bottles.</td>
<td>F. Blood culture bottles have vacuum, but it is not always measured as in evacuated tubes.</td>
</tr>
<tr>
<td>7. _____ Reapply tourniquet and perform venipuncture without touching the site.</td>
<td>G. Aseptic technique reduces the risk of false positives due to contamination.</td>
</tr>
<tr>
<td>8. _____ Inoculate the media bottles as required.</td>
<td>H. The tops of the culture bottles must be free of contaminants when they are inoculated.</td>
</tr>
<tr>
<td>9. _____ Label the specimen containers with required ID, including the site of collection.</td>
<td>I. Bacteria exist on the skin surface and can be removed temporarily.</td>
</tr>
</tbody>
</table>

SKILLS DRILL 11-4: BLOOD BANK ID, LABELING, AND SPECIMEN REQUIREMENTS

1. What types of collection tubes could be used? What type of tube is most often used?

2. List four reasons why blood bank collection tubes might be rejected.
   1. 
   2. 
   3. 
   4. 

3. How long is a BB band on a patient’s arm valid. How is that calculated?

4. The Joint Commission’s National Patient Safety Goal 01.01.01 states:
5. Why does a “blood recipient patient ID system allow for one-person verification for blood transfusions?

6. The nurse who is going to administer a blood transfusion initiates the validation for a patient by gathering four key facts about the blood product in the presence of the patient, and they are:
1. 
2. 
3. 
4. 

7. Why is a grossly hemolyzed sample not acceptable for BB testing?

8. If you must collect a BB specimen and the patient has an IV, what additional responsibilities does the phlebotomist have at that time?

**SKILLS DRILL 11-5: TB TEST ADMINISTRATION** (Text Procedure Box 11–4)

Instructions: Using the TEXTBOOK, fill in the blanks with the missing information.

**Step**

1. Identify the patient, (A) ____________ the procedure, and sanitize hands

   **Rationale**
   Correct ID is vital to patient safety and meaningful test results. Proper hand hygiene plays a major role in infection control by protecting the phlebotomist, patient, and others from contamination. Gloves are sometimes put on at this point. Follow facility protocol.

2. Support the patient’s arm on a firm surface and select a suitable site on the (B) ____________ of the forearm, (C) ____________ the antecubital crease.

   **Rationale**
   The arm must be supported to minimize movement during test administration. Areas with scars, bruises, burns, rashes, excessive hair, or superficial veins must be avoided as they can interfere with (D) ________________ of the test.

3. Clean the site with an (E) ____________ pad and allow it to air dry.

   **Rationale**
   Cleaning with antiseptic and allowing it to air dry permits maximum antiseptic action.

4. Put on gloves at this point if you have not already done so.

5. Clean the top of the antigen bottle and draw (F) ____________ of diluted antigen into the syringe.

   **Rationale**
   The top of the bottle must be clean to prevent (G) ________________ of the antigen.
6. Stretch the skin (H) \[\text{chars}\] with the thumb in a manner similar to venipuncture and slip the needle just under the skin at a very (I) \[\text{chars}\] \[\text{chars}\] \[\text{chars}\] \[\text{chars}\] \[\text{chars}\] \[\text{chars}\] \[\text{chars}\] \[\text{chars}\] \[\text{chars}\] \[\text{chars}\] \[\text{chars}\] \[\text{chars}\] \[\text{chars}\] \[\text{chars}\] (approximately 10 to 15 degrees).

7. Pull (K) \[\text{chars}\] on the syringe plunger slightly to make certain a vein has not been entered.

8. Slowly expel the contents of the syringe to create a distinct, pale elevation commonly called a bleb or (L) \[\text{chars}\].

9. Without applying pressure or gauze to the site, withdraw the needle, activate safety feature, and discard the needle.

10. Ensure that the arm remains extended until the site has time to close. Do (O) \[\text{chars}\] \[\text{chars}\] a bandage.

11. Check the site for a reaction in (P) \[\text{chars}\]. This is called “reading” the reaction.

12. Measure (Q) \[\text{chars}\] (hardness) and interpret the result. Do not measure erythema (redness).

   **Negative:** induration absent or less than 5 mm in diameter.
   **Doubtful:** induration between 5 and 9 mm in diameter.
   **Positive:** induration (S) \[\text{chars}\] \[\text{chars}\] \[\text{chars}\] \[\text{chars}\] \[\text{chars}\] in diameter.
SKILLS DRILL 11-6: PREGNANCY TEST PROCEDURE

Instructions: Match the rationale with the corresponding step in the procedure.

<table>
<thead>
<tr>
<th>Procedure Step</th>
<th>Rationale</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. _____ Identify the patient according to facility policy.</td>
<td>A. To avoid errors, label the specimen even if it is the only one being tested at that time.</td>
</tr>
<tr>
<td>2. _____ Label the specimen cup with the patient’s label.</td>
<td>B. For correct results, the urine must flow evenly onto the testing surface of the device.</td>
</tr>
<tr>
<td>3. _____ Obtain the patient’s urine specimen.</td>
<td>C. The reaction time must be carefully timed and <em>not read</em> after 10 minutes.</td>
</tr>
<tr>
<td>4. _____ Remove the test device from the protective pouch and place it on a flat surface.</td>
<td>D. The size of the drops must be exactly as specified and consistent for results to be accurate.</td>
</tr>
<tr>
<td>5. _____ Using the disposable dropper provided, add 3 drops of sample to the cassette well.</td>
<td>E. Correct ID is vital to patient safety and meaningful test results.</td>
</tr>
<tr>
<td>6. _____ Set a timer for the time the kit’s manufacturer states a negative test must be read.</td>
<td>F. If the patient will be collecting a urine specimen at your testing site, explain how to do so.</td>
</tr>
<tr>
<td>7. _____ Read the cassette window’s results when the timer goes off.</td>
<td>G. A positive result can be read as soon as lines at both the T and C areas of the test cassette window appear.</td>
</tr>
</tbody>
</table>
Crossword

ACROSS
1. Coagulation test to monitor heparin therapy
2. Increased blood potassium
5. Scientific symbol for mercury
6. Blood types that are suitable to mix
8. BAC tests for this type of alcohol (abbrev)
11. Blood donated by people who will use it themselves
13. Another name for occult blood testing
14. Institute interested in curbing drug abuse and addition
15. Traceable component in Lookback program (abbrev)
16. Blood bank identification system
17. Type of antimicrobial resin
19. Initials used for a heart attack
20. Fluid around spinal column (abbrev.)
22. Type of Hgb that is measured in blood plasma
23. QC built into the instrument (abbrev.)
24. Checks to ensure that testing is done properly (abbrev.)
25. Agency that regulates blood products
27. Body fluid excreted by kidneys
31. Approx. number of gestational weeks for peak HCG levels
32. Cardiac protein specific for heart muscle
34. IL instrument that screens for renal disease
35. POC multi-test-panel chemistry analyzer
36. What i-STAT testing chip is called
38. Type of glucose meter
39. Org. sets guidelines for blood centers (abbrev)
41. BC media bottle used to grow microbes needing air

DOWN
1. Process of clumping together (i.e., Ag-Ab reaction)
2. Pertaining to a low glucose level
3. Partial thromboplastin time
4. Identification (abbrev.)
7. Strict protocol for forensic specimens
9. Tight glycemic index
10. Another name for small, portable POC instruments
12. Condition of microorganisms and toxins in the blood
18. Volunteer who gives blood for another person’s use
21. Body discharge used to test for occult blood
25. Name of charcoal antimicrobial resin bottle (abbrev.)
26. BC media bottle used to grow microbes without air
27. Urinalysis (abbrev.)
28. Federal law that states qualifications for POCT personnel
29. A 9:1 ratio of blood to this anticoagulant is required
30. Extended test used to diagnose carbohydrate metabolism issues (abbrev.)
33. Generic name for grouping of commonly ordered tests
37. POCT kidney function test (abbrev)
40. One of the electrolytes measured by POC instruments
Chapter Review Questions

1. The fasting specimen for a GTT is drawn:
   a. as close to 6:00 A.M. as possible.
   b. before the test has actually begun.
   c. right after the glucose drink is finished.
   d. when the timing for the test begins.

2. Which of the following tube additives is preferred for the collection of a blood culture specimen?
   a. Citrate phosphate dextrose
   b. Sodium or potassium heparin
   c. Sodium polyanethol sulfonate
   d. Potassium oxalate and fluoride

3. TDM trough concentration may be defined as the:
   a. highest concentration of the drug during a dosing interval.
   b. lowest concentration of the drug during a dosing interval.
   c. maximum effectiveness of the drug in the tissues.
   d. none of the above.

4. In performing a glucose tolerance test, the fasting specimen is drawn at 6:15 A.M. and the patient finishes the glucose beverage at 6:30 A.M. When should the 2-hour specimen be collected?
   a. 8:15
   b. 8:30
   c. 9:15
   d. 9:30

5. Typical labeling requirements for a blood bank specimen include:
   a. full name of the physician who ordered the crossmatch
   b. hospital ID number only, no other identifier is accepted
   c. patient’s date of birth and date and time of collection
   d. patient’s first and last name, no middle initial needed

6. Withdrawing a unit of blood from a patient for therapeutic purposes is used as a treatment for:
   a. bacteremia
   b. polycythemia
   c. major surgery
   d. all of the above

7. During a GTT, which of the following is acceptable?
   a. Allowing the patient to drink water at any time during the test
   b. Giving coffee to the patient after drawing the fasting specimen
   c. Permitting the patient to chew sugarless gum and smoke
   d. Timing all specimen collection after the fasting specimen was collected

8. A stool specimen is needed for the ________ test.
   a. A1 c. Guaiac
   b. Lipid d. Strep

9. For what purpose is the Oral Glucose Challenge test used?
   a. To assess kidney and bladder function
   b. To check for lactose intolerance
   c. To detect absorption function disorders
   d. To screen for gestational diabetes

10. Autologous donation is performed to:
    a. avoid a transfusion reaction.
    b. save time in surgery.
    c. correct polycythemia.
    d. prevent stress on the heart.

11. Glycosylated hemoglobin is performed to monitor the effectiveness of therapy in which of the following conditions?
    a. Acidosis
    b. Diabetes
d. Renal disease

12. Prior to performing a test on a POCT instrument, the phlebotomist should:
    a. be able to operate the instrument correctly.
    b. be familiar with the instrument’s maintenance procedures.
    c. understand the quality assurance aspects of the instrument.
    d. all of the above.

13. According to American Red Cross, persons wishing to donate blood must be:
    a. a resident of the state for at least 3 years.
    b. at least 17 years old in most of the states.
    c. fasting for 8 to 12 hours before arriving
    d. no less than 120 pounds and ambulatory

14. Which of the following procedures is required for a BC using a Chloroprep kit?
    a. Cleansing bottle tops with isopropyl alcohol
    b. Isopropyl swab before using Chloroprep
    c. Scrubbing for a full 2 minutes
    d. Using concentric circles with PVP

15. Blood bank specimens require which of the following identification information?
    a. Date and time of collection
    b. Patient’s date of birth
    c. Patient’s full name
    d. All of the above
16. The HemoCue Plasma/Low Hemoglobin instrument is used to indicate:
   a. iatrogenic anemia.
   b. hemolyzed red cells.
   c. kidney malfunction.
   d. respiratory distress.

17. Peak and trough specimens are collected for
   a. blood cultures times two.
   b. blood units to be cross-matched.
   c. cardiac enzyme evaluation.
   d. therapeutic drug monitoring.

18. In collecting blood cultures, one of the most frequent errors made is
   a. failure to inoculate two media bottles
   b. improper cleansing of the collection site
   c. incorrect labeling of the media bottles.
   d. not noting the venipuncture location.

19. Which of the following tests does not require special chain-of-custody documentation when collected?
   a. BAC
   b. Drug screen
   c. Paternity testing
   d. TDM

20. Which of the following POC tests is used to monitor warfarin therapy?
   a. ACT
   b. BN
   c. INR
   d. PTT

21. Pediatric blood cultures creates challenges because:
   a. BC collection requires two sets of cultures from one venipuncture
   b. most ill children have already received broad-spectrum antibiotics
   c. special media bottles are made to accommodate children’s veins
   d. the antiseptic technique is different if you use Chloroprep swab

22. Hyperkalemia means:
   a. decreased calcium in the blood.
   b. increased calcium in the blood.
   c. increased potassium in the blood.
   d. increased sodium in the blood.

23. Postprandial refers to:
   a. after eating a meal.
   b. after fasting for 2 hours.
   c. just before eating.
   d. after medication.

24. In collecting a blood alcohol test for forensic purposes, the venipuncture site can be cleaned with:
   a. benzalkonium chloride.
   b. isopropyl alcohol.
   c. methyl alcohol.
   d. tincture of iodine.

25. Which of the following should be removed from a list of tests that the i-STAT instrument can measure?
   a. CBC and PT
   b. Hgb and Hct
   c. Gluc and BUN
   d. Na⁺ and K⁺

26. Blood levels of this specific analyte begin to rise within 4 hours of an MI.
   a. ALT
   b. TnT
   c. LDL
   d. BNP

27. When does the Lookback program occur?
   a. If there is a transfusion of incompatible blood to a patient
   b. At the time the unit is collected at the Blood Donor Center.
   c. When the blood service is made aware of a transfusion infection
   d. Before the blood unit is matched to a recipient’s blood sample.

28. Molecular genetic testing requires:
   a. chain of custody protocol to be followed
   b. freezing of the spun sample immediately
   c. RNA tubes to be incubated at 37°C
   d. specimens to be collected in sterile EDTA

29. In the DOT’s 10 Steps to Collection Site Security & Integrity, drug screen testing is secured for collection of the urine specimen because:
   a. employees must empty pockets and leave bags behind
   b. the collection site is inspected after completion
   c. the employee is closely observed by video camera
   d. the employee takes the specimen to the testing site

30. Monitoring the quality of waived testing being done at the bedside is a constant challenge for the laboratory because:
   a. more tests are classified as waived each year
   b. personnel doing waived testing are not trained
   c. quality control is not required for waived testing
   d. technology cannot keep up with big demand
Case Studies

Case Study 11-1: Prothrombin Test Collection

During clinical practicum, a phlebotomy student found that the requirements for drawing prothrombin times were not the same as he was taught in class. His clinical coordinator made it very clear that he was to follow facility protocol while he was in his clinical practicum. Therefore, when he was asked to collect a CBC and prothrombin time from a patient, he knew that the order of draw at this facility was citrate first, no discard tube. As he started to draw the specimen from the patient, he immediately ran into trouble when the vein rolled. He was certain that the needle had slipped beside the vein, so he tried to redirect it into the vein. After two unsuccessful redirects, the needle successfully entered the vein. He collected the citrate tube, followed by a lavender-top tube for the CBC. Later that day the coagulation department rejected the specimen and he was sent to re-collect it.

QUESTIONS
1. Why would the laboratory reject the sample?
2. What had the student done to cause the sample to be rejected?
3. How could the problem have been corrected while the needle was still in the arm?

Case Study 11-2: Blood Cultures and Butterflies

A phlebotomist was acting as preceptor for a phlebotomy student from the local college and was anxious to help her learn all the special tests that had not been practiced in class. When a stat blood culture and lytes on a patient in the ICU were ordered, the preceptor quickly grabbed the student and they headed for the floor. It was clear after looking at the patient that they would have to use a butterfly in a hand vein to collect the test specimens. The preceptor was busy helping the student prepare the site and, while setting out all of the equipment needed, he did not pay close attention to the order in which the media bottles were placed. The student was elated that she was able to access the difficult vein and that blood was flowing freely into the anaerobic bottle. After filling both it and the aerobic bottle to the proper level, she proceeded to draw an SST for electrolytes from the same site. The blood flow was now very slow, with blood entering the tube only a drop at a time. After patiently waiting for the tube to fill, both she and the preceptor were relieved to get finished. Almost immediately after returning to the laboratory and processing the sample, they were sent back to redraw the electrolytes because the potassium value was too high. Before leaving, the preceptor grabbed more BC equipment because he knew that the BCs would have to be redrawn also.

QUESTIONS
1. What had caused the potassium to be too high?
2. Why might they have expected this problem during the collection?
3. Why did the preceptor have the student redraw the BC also?
Case Study 11-3: Forensic Blood Alcohol Collection

In his first week on the job, a new graduate phlebotomist is called to the ER for a stat blood draw. When he arrives he is told to collect an ETOH. The patient smells heavily of alcohol and the phlebotomist is pretty certain that this is going to be an elevated ETOH with a legal investigation involved. The phlebotomist studied forensic blood alcohol collection in his training program, but this is the first real one he has collected and he is a little unsure of what to do. He remembers that a certain strict protocol is involved and that the site must not be cleaned with alcohol. All he has on his tray other than alcohol preps are a few benzalkonium chloride preps. He decides to use those. Laboratory protocol says to use an SST for an ETOH level, but he remembers something from his training about drawing a forensic ETOH in a gray top. He decides to draw one of each tube, collecting the SST first. A police officer arrives just as he is finishing and asks for the specimen in the gray-top tube and the accompanying paperwork. The phlebotomist feels relieved and returns to the laboratory.

QUESTIONS

1. Was the phlebotomist correct in deciding that the ETOH was going to involve an investigation, and what does a forensic collection involve?

2. What is the strict protocol that the phlebotomist remembered from his training and what does it involve?

3. Was benzalkonium chloride an acceptable antiseptic to use to collect the specimen?

4. Was it acceptable to draw both an SST and a gray top?