Phlebotomy Questions

Part I. Questions and Reference provides practice questions that can be self-scored and a list of references that contain additional study material. The best way to use this part of the booklet is to answer the questions BEFORE looking at the answer key. That makes this exercise about testing yourself rather than learning as you go.

1. The forearm vein most commonly used for venipuncture is the _____.
   a. median cubital
   b. basilica
   c. cephalic
   d. radial

2. The smallest veins in the human body are known as _____.
   a. villi
   b. bronchioles
   c. venules
   d. lymph glands

3. The aorta branches into smaller divisions called arteries, which in turn branch into even smaller divisions called_____.
   a. capillaries
   b. arterioles
   c. venules
   d. lymph glands

4. Characteristics of capillaries include _____.
   a. having thin-walls
   b. forming microscopic pathways
   c. connecting arterioles with venules
   d. all of the above

5. Within the capillaries, blood cell functions include_____.
   a. releasing oxygen
   b. binding carbon dioxide
   c. eliminating waste
   d. all of the above

6. The heart, lymphatic organs, and blood vessels are in the _____ system.
   a. respiratory
   b. cardiovascular
   c. digestive
   d. urinary

7. The suffix – URIA- at the end of the medical term refers what body fluid?
   a. blood
   b. urine
   c. CSF
   d. synovial fluid

8. The study of blood is known as _____.
   a. hematology
   b. hematoxylin
   c. hemoglobin
   d. hemolysis

9. The liver, stomach, mouth and pancreas are in the _____ system
   a. reproductive
   b. sensory
   c. digestive
   d. muscular

10. The most important step to ensure accuracy in sample collection is _____.
   a. recording the time accurately
   b. by always wearing gloves
   c. keeping the patient supine
   d. identifying the patient properly

11. The bladder, urethra, kidneys, and ureters are in the _____ system.
   a. urinary
   b. reproductive
   c. respiratory
   d. muscular

12. The trachea, nose, lungs and pharynx are in the _____ system.
   a. skeletal
   b. respiratory
   c. nervous
   d. sensory

13. The sebaceous glands, skin hair and nails are in the _____ system.
   a. nervous
   b. cardiovascular
   c. sensory
   d. integumentary

14. The body system that is a primary regulator of hormones is the _____ system
   a. reproductive
   b. endocrine
   c. integumentary
   d. cardiovascular

15. Neutrophils, eosinophils, basophils, lymphocytes and monocytes are types of _____.
    a. red blood cells
    b. coagulation factors
    c. anticoagulants
    d. white blood cells

16. The common name for the thrombocyte is the _____.
    a. red blood cell
    b. white blood cell
    c. bone marrow
    d. platelet

17. The liquid portion of an anticoagulated blood sample is known as _____.
    a. serum
    b. clot
    c. plasma
    d. hematocrit

18. The instrument that measures blood pressure is called a _____.
    a. sphygmomanometer
    b. hydration barometer
    c. temperature probe
    d. co-oximeter

19. An artery can be distinguished from a vein because an artery will be _____.
    a. harder
    b. pulsating
    c. a different color
    d. softer

20. Lancets are used to collect blood samples by _____.
    a. venipuncture
    b. arterial puncture
    c. venous accession devices
    d. capillary or skin puncture

21. The abbreviation VAD is commonly used in hospitals to refer to _____.
    a. venous anesthetic devices
    b. venous access devices
    c. various anesthetic devices
    d. variable antiseptic dilutions

22. To determine the size of the needle, remember that the higher the gauge, the _____.
    a. longer the needle length
    b. smaller the needle bore
    c. shorter the needle length
    d. larger the needle bore

23. Adult capillary punctures most often involve use of the _____ finger(s).
    a. second (index)
    b. little (fifth)
    c. third and fourth (middle and ring)
    d. second and third (index and middle)

24. A centrifuge is used in a clinical laboratory setting to _____.
    a. sort tubes of different colors
    b. store tubes at correct temperatures
    c. measure blood oxygen levels
    d. separate liquid from cells in blood

25. The oral glucose tolerance test is used for detection of _____.
    a. hepatitis
    b. diabetes
    c. mononucleosis
    d. aids

26. Use a _____ -topped evacuated tube for collection of blood for a CBC test.
    a. black
    b. lavender
    c. red
    d. blue

27. Use a _____ -topped evacuated tube for collection of blood for electrolyte testing.
    a. yellow
    b. red
    c. blue
    d. lavender

28. Use a _____topped evacuated tube for collection of blood for cholesterol testing.
    a. red
    b. yellow
    c. blue
    d. lavender

29. Sodium citrate is an anticoagulant of choice for coagulation studies because it protects _____.
    a. clotting factors
    b. red blood cells
    c. white blood cells
    d. enzyme inhibitors

30. When preparing a blood smear directly from a skin puncture, it is best to _____.
    a. use plastic slides instead of glass
    b. make it as thick as possible
    c. wipe away the first drop of blood
    d. add sodium citrate to the blood

The order of draw recommended by the CLSI (2007) for these tubes is _____.

31.	____ First	a.	orange
32.	____ Second	b.	glycolytic inhibitor (gray)
33.	____ Third	c.	coagulation tube (blue)
34.	____ Fourth	d.	serum tubes (red) w/or w/o clot activator or gel
35.	____ Fifth	e.	blood culture tube
36.	____ Sixth	f.	heparin tube w/ or w/o gel plasma separator (green)
		g.	EDTA (lavender)

Put these 10 selected phlebotomy steps in the correct order:

37.	____ Greet and identify the patient	a.	1st
38.	____ Insert the needle	b.	2nd
39.	____ Cleanse the venipuncture site	c.	3rd
40.	____ Explain the procedure to the patient	d.	4th
41.	____ Anchor the vein	e.	5th
42.	____ Collect Blood in Vacuum tubes	f.	6th
43.	____ Label tubes	g.	7th
44.	____ Dispose of needle	h.	8th
45.	____ Remove tourniquet	i.	9th
46.	____ Assemble equipment	j.	10th

47. The purpose of doing blood cultures is to detect _____.
    a. anemia
    b. cholesterol
    c. cancer
    d. septicemia

48. Anticoagulants are used to _____.
    a. fight infection
    b. prevent blood from clotting
    c. neutralize stomach acid
    d. inhibit bacterial growth

49. White blood cells help the body by _____.

a. carrying oxygen to the tissue
b. collecting waste products
c. defending against foreign invaders
d. assisting in hemostasis

50. Platelets help the circulation by _____.
a. carrying oxygen
b. collecting waste products
c. defending against foreign invaders
d. participating in hemostasis

51. When blood seeps into the surrounding tissue during a venipuncture, a _____ may form.
a. petechia
b. carbuncle
c. hematoma
d. hemolysis

52. In a patient with a clotting disorder, pressure should be applied to the puncture site for at least _____ after venipuncture to insure blood stoppage.
a. 3 minutes
b. 5 minutes
c. 7 minutes
d. 10 minutes

53. Skin punctures may be indicated for use when _____.
a. the patient is an infant, toddler, or preschooler
b. only a small amount of blood is needed
c. patient veins need o be preserved for iv therapy
d. all of the above

54. All specimens should be labeled with _____.
a. patient's name (and numeric id)
b. date and time the specimen was drawn
c. collector's initials
d. all of the above

55. When performing a skin puncture, squeezing the finger too tightly may dilute the blood with _____ and ruin the test.
a. swab particles
b. alcohol
c. skin particles
d. tissue fluid

56. One test often used to assess hemostasis before surgery is _____.

a. blood culture
b. hemoglobin
c. platelet count
d. bleeding time

57. One possible cause of unexpected clotting in an anticoagulated blood tube might be _____.
a. use plastic slides instead of glass
b. make it as thick as possible
c. wipe away the first drop of blood
d. add sodium citrate to the blood

58. When performing a venipuncture, position the bevel of the needle _____.
a. facing up
b. facing down
c. turned sideways
d. none of the above

59. If blood does not appear in an evacuated tube upon venipuncture, a phlebotomist's first course of action should be to _____.
a. pop the tourniquet and tie it tighter
b. pull the needle out and start over
c. slightly reposition the needle
d. push the needle further up the lumen

60. Redirecting a needle during venipuncture is sometimes necessary when _____.
a. the vein was not properly anchored
b. the patient moves unexpectedly
c. blood flow starts, and then stops
d. all of the above

61. A vein might be prone to collapse if the _____.
1. vacuum tube is too large for vein
2. syringe plunger was pulled back too quickly
3. vacuum tube lost its vacuum
4. tourniquet was too tight

a. 1, 2, 3, 4
b. 1, 2, 3
c. 3, 4
d. 1, 2

62. Hemolysis would cause rejection of a sample collected for _____ testing.
a. potassium
b. pregnancy
c. rubella
d. pyruvate

63. If a patient is prone to syncope during venipuncture, the phlebotomist should _____.

a. cancel the order entirely
b. tie the tourniquet tighter
c. watch in case of fainting
d. use caffeine as a stimulant

64. A tube of blood that arrives in the laboratory without a label must be _____.
a. labeled by the phlebotomist
b. labeled by the doctor
c. labeled by the nurse
d. rejected automatically

65. If a blood sample should be collected 2 hours post-prandial, the phlebotomist should collect the sample _____.
a. 2 hours after a meal
b. 2 hours before bedtime
c. 2 hours after wake-up
d. 2 hours before a meal

66. Knowing when to collect peak and trough levels is important when drawing _____.
a. blood cultures
b. therapeutic drugs
c. cortisol levels
d. estrogen levels

67. A pre-warming technique may be used to _____.
a. keep the patient warm during phlebotomy
b. warm the vacuum tubes for testing
c. increase patient's tendency to bleed
d. separate plasma from formed elements

68. The role of all anticoagulants is ultimately to prevent formation of _____.
a. Fibrin
b. Factor VII
c. Platelets
d. Collagen

69. The anticoagulant EDTA works by _____.
a. binding prothrombin
b. lysis of red blood cells
c. inactivating thrombin
d. binding calcium

70. If the tourniquet is not released before the needle is withdrawn from the arm during venipuncture, this will most likely result in _____.
a. Bleeding from the site

b. Syncope in the phlebotomist
c. Bruising at the base of the arm
d. Inaccurate test results

71. Which of these test samples are light sensitive?
a. Arterial blood gases
b. Ammonia
c. Bilirubin
d. ACTH

72. The _____ must be followed exactly whenever drawing patient test samples that may be used in a legal proceeding.
a. Chain of command
b. Chain of custody
c. Standard deviation
d. Coefficient of variation

73. The anticoagulant SPS (sodium polyanetholesulfonate) is recommended for use in blood cultures because it _____.
a. is less expensive than most
b. has a longer half-life than most
c. does not inhibit bacterial growth
d. is completely biodegradable

74. Before entering an inpatient room if the door is closed the phlebotomist should always _____.
a. knock
b. ask for permission to enter
c. check for isolation signage
d. all of the above

75. Before entering designed isolation rooms phlebotomists should always _____.
a. put on masks and foot coverings
b. put on gowns and tie them
c. check requirements on signs
d. call a nurse of physician

76. The single most important means of preventing the spread of infection in a hospital is by _____.
a. wearing gowns
b. hand washing
c. using disposables
d. keeping rooms clean

77. The most prevalent type of *nosocomial* infections are those of the _____.
a. skin
b. digestive tract
c. gastrointestinal tract

d. urinary tract

78. Phlebotomists have a statistically greater chance of contracting _____ in a work-related incident than they do of contracting AIDS.
    a. mononucleosis
    b. hepatitis
    c. cancer
    d. Strep throat

79. AIDS is caused by _____.
    a. parasites
    b. HIV virus
    c. bacteria
    d. kissing

80. When performing heelsticks on infants in a hospital nursery, it is important never to _____.
    a. wash your hands
    b. share supplies from one infant to another
    c. wake up a sleeping infant
    d. touch the infant in any way

81. When delivering blood samples to a laboratory, they should always be transported _____.
    a. inside sealed plastic bags
    b. inside triple-sealed plastic bags
    c. inside brown paper sacks
    d. individually boxed

82. If a biohazard spills in the laboratory, a phlebotomist should first try to _____.
    a. call a physician to the site
    b. wash his or her hands
    c. contain the spill safely
    d. pull the fire alarm

83. According to OSHA, a contaminated needle may be safely discarded into a _____.
    a. hard sided rash can
    b. sharps container
    c. plastic cup
    d. all of the above

84. In most hospitals, a phlebotomist with a cough may draw blood from a patient provided the _____.
    a. patient is not in reverse isolation
    b. phlebotomist wears a mask
    c. phlebotomist does not have a fever
    d. all of the above

85. When drawing blood from pediatric inpatients, a phlebotomist can increase safety for the patients by _____.
    a. getting help to hold the patent securely during the draw
    b. using a smaller bore needle and small collection tubes
    c. making sure the bedrails are left raised if found that way
    d. all of the above

86. To eliminate bacteria from the skin of a bacterial culture venipuncture site, _____ is sometimes used in addition to alcohol in the skin cleansing process.
    a. chlorine bleach
    b. iodine
    c. aspirin
    d. ammonia

87. The term that refers to right and wrong conduct is _____.
    a. empathy
    b. sympathy
    c. ethics
    d. rights

88. An unlawful threat or attempt to do bodily injury to another is _____.
    a. litigation
    b. assault
    c. crime
    d. libel

89. Law protects the health worker if it can be determined that he or she acted reasonably as compared with fellow workers; this is called _____.
    a. negligence
    b. reasonable care
    c. duty of care
    d. statute

90. Negligence by a professional person is called _____.
    a. invasion of privacy
    b. slander
    c. malpractice
    d. tort

91. The ability to see things from another person's point of view is _____.
    a. consent
    b. sympathy
    c. empathy
    d. ethics

92. A violation of a person's right not to have his or her name, photograph, or private affairs made public without giving consent is _____.
    a. false imprisonment
    b. malpractice
    c. invasion of privacy
    d. statute

93. Information given by a patient to medical personnel that cannot be disclosed without consent constitutes _____.
    a. duty of care
    b. negligence
    c. judgment
    d. privileged communication

94. Failure to do something a reasonable person would do under ordinary circumstances, or doing something a reasonable person would not do under ordinary circumstances thereby causing hard to another person is called _____.
    a. malpractice
    b. negligence
    c. slander
    d. defamation

95. Permission granted by a person voluntarily (and in his right mind) is _____.
    a. consent
    b. litigation
    c. breach
    d. duty of care

96. A phlebotomist who attempts to draw blood without sufficient training could be accused of _____ if the procedure is performed incorrectly, causing harm to the patient.
    a. duty of care
    b. abandonment
    c. negligence
    d. incompetence

97. Forcing venipuncture on a patient who has refused it would be considered _____.
    a. assault
    b. battery
    c. slander
    d. contributory negligence

98. The branch of study of moral issues, questions, and problems arising in the practice of medicine and biomedical research is called _____.
    a. bioethics
    b. litigation
    c. biocommunications
    d. privileged communication

99. Conduct, courtesy, and manners, customary in the medical profession, is called _____.
    a. ethics
    b. judgment
    c. tort
    d. medical etiquette

100. Each and every patient is entitled to _____ as a part of his/her patient rights.
    a. respect and complete care
    b. what he can afford
    c. how much insurance he has
    d. what his family can afford

101. Some suggested methods for controlling on the job stress during phlebotomy might include _____.
    a. reading the newspaper while working
    b. drinking lots of coffee
    c. taking deep breaths if anxious
    d. screaming to rid oneself of anger

102. An appropriate means of communicating with a patient who is profoundly hearing impaired might include _____.
    a. ignoring the patient entirely
    b. talking only to a hearing relative
    c. using written communication
    d. trying to speak a little louder

103. I performing phlebotomy on children, it is best to _____.
    a. talk softly and gently
    b. enlist the help of parents
    c. tell the truth if asked
    d. all of the above

104. In approaching an elderly patient, it is appropriate to call the patient by name using _____.
    a. Miss, Mrs., or Mr.
    b. his/her first name
    c. his/her nick name
    d. something like “honey”

105. A patient who is making a fist and frowning is exhibiting _____ body language.
    a. positive
    b. compliant
    c. excited
    d. uncooperative

106. A rubber or plastic tube used to drain or inject fluid through a body opening is called _____.
    a. injection
    b. venipuncture

c. catheter
d. none of the above

107. A 24-hour urine specimen must be kept _____.
a. warm
b. frozen
c. refrigerated
d. at room temperature

108. A chronic disease in which the pancreas fails to secrete enough insulin is called _____.
a. high blood pressure
b. diabetes mellitus
c. A.I.D.S.
d. renal disease

109. The purpose of the bleeding time test is to assess _____.
a. platelet plug formation in the capillaries
b. the pressure of the blood vessels
c. elasticity in the major blood vessels
d. the amount of blockage in the veins

110. Diurnal rhythms refer to variations in the body's functions or fluids that occur during _____.
a. nighttime
b. every 24 hours
c. cyclically once per month
d. sleep

111. EMLA is an emulsion of lidocaine and prilocaine that can be used to _____.
a. sterilize a venipuncture site
b. anticoagulate whole blood
c. topically anesthetize a draw site
d. what his family can afford

112. Another name for red blood cells is _____.
a. platelets
b. leukocytes
c. bone marrow
d. erythrocytes

113. The artery located in the groin, lateral to the femur bone which is used as an alternative site for arterial blood gas collections is the _____.
a. radial
b. ulnar
c. carotid

d. femoral

114. The federal law that was expanded in 2000 to protect the confidentiality of electronically stored health information is abbreviated as _____.
   a. CLIA
   b. HIPAA
   c. OSHA
   d. EPA

115. The study of all aspects of disease in the body is known as _____.
   a. phlebotomy
   b. hematology
   c. histology
   d. pathology

116. The phase of laboratory testing that refers to test orders, test collection and test sample preparation are all part of the _____ phase.
   a. exponential
   b. pre-analytical
   c. testing
   d. post-prandial

117. A patient in reverse isolation has been so placed because s/he _____.
   a. needs protection from others carrying infection
   b. has tuberculosis or a similar respirator disease
   c. needs to keep all blood and body fluids away from staff
   d. has an infection in a wound or atop the skin

Match these common laboratory abbreviations or terms as appropriate.

118. ____ EDTA
119. ____ NaCirate
120. ____ ABG
121. ____ FUO
122. ____ STD

a. custody and control form
b. arterial blood gases
c. complete blood count
d. hemoglobin and hematocrit
e. gray top tube
f. anticoagulant in blue top tubes
g. center for disease control
h. blood culture tube
i. quantity controlled

123. ____ H&H
124. ____ CBC
125. ____ Electrolytes
126. ____ QC
127. ____ CDC

j. red top or speckled tube
k. quality control
l. quality assurance
m. fever of unknown origin
n. already been gathered
o. for use of others
p. anticoagulant in lavender top tubes
q. sexually transmitted diseases

128. _____ are contaminated objects that can penetrate the skin including, but not limited to needles, scalpels, broken glass, broken capillary tubes, and exposed ends of dental wires.
    a. Infectious waste materials
    b. Disposable devices
    c. Contaminated sharps
    d. Dangerous incisors

129. Reasonable possibility of skin, eye, mucous membrane, or parenteral contact with blood or other potentially infectious materials that may result from the performance of an employee's regular duties is termed _____.
    a. occupational exposure
    b. biohazardous probability
    c. job-related infestation
    d. professional acquisition

130. All of the following are examples of "Personal Protective Equipment" ***except*** _____.
    a. uniforms
    b. gloves
    c. aprons
    d. masks

131. To use a physical-chemical procedure to destroy all microbial life including highly resistant bacterial endospores is to _____.
    a. eradicate
    b. toxify
    c. sterilize
    d. acid wash

132. _____ is the single most important source of HIV and HBV in the workplace.
    a. Semen
    b. Saliva in dental procedures
    c. Pleural fluid
    d. Blood

133. OSHA requires that training and educational information on bloodborne pathogens be provided to hospital or clinical employees _____.
    a. in large workplaces only
    b. at no cost to them
    c. only if they request it
    d. if anyone has had an accident

134. All workers whose jobs involve participation in tasks or activities with exposure to blood or other body fluids, to which universal precautions apply, should be vaccinated with a _____ vaccine.
    a. human immunodeficiency
    b. hepatitis C
    c. small pox
    d. hepatitis B

135. After they are used, disposable syringes and needles, scalpel blades and other sharp items, should be placed in _____ containers for disposal.
    a. biodegradable
    b. puncture-resistant
    c. OSHA
    d. sanitized

136. Broken glassware that may be contaminated should be picked up by _____.
    a. an environmental control specialist
    b. someone who's not afraid to do it
    c. mechanical means (broom/dustpan)
    d. the end of the shift

137. Contaminated laundry should be _____ where it was soiled.
    a. destroyed at the location
    b. transported away from the location
    c. disinfected or discarded at the location
    d. bagged or containerized at the location

138. A specific eye, mouth, other mucous membrane, non-intact skin, or parenteral contact with blood or other potentially infectious materials that results from the performance of an employee's duties is called _____.
    a. unfortunate incident
    b. hazardous exposure
    c. occupational hazard
    d. exposure incident

139. In the health care field when all evaluated services and the results compare with accepted standards, principles of _____ have been used.
    a. quality assurance
    b. regulatory bodies
    c. networking
    d. management

140. The federal government requires that specimens are transported or shipped in _____.
    a. paper containers
    b. watertight containers
    c. cardboard containers
    d. egg crate containers

141. The classification the physician's office laboratory (POL) falls into will be determined by _____.
    a. complexity of laboratory tests performed
    b. number of employees working there
    c. ratio of male to female employees
    d. length of time in operation

142. Tests that basically pose insignificant risks to patients if errors occur in the test performance are called _____.
    a. level I laboratory tests
    b. waived tests
    c. level II laboratory tests
    d. none of the above

143. When you send blood tubes by mail for analysis n a watertight container, they should be enclosed in _____.
    a. paper box
    b. second durable watertight container
    c. secure certified mail envelope
    d. overnight envelope

144. When you send specimens in the mail, the label should state _____.
    a. biohazardous materials
    b. in case of breakage, send to CDC
    c. address of lab
    d. all of the above

1.	A	49.	C	97.	B
2.	C	50.	D	98.	A
3.	B	51.	C	99.	D
4.	D	52.	B	100.	A
5.	D	53.	D	101.	C
6.	B	54.	D	102.	C
7.	B	55.	D	103.	D
8.	A	56.	D	104.	A
9.	C	57.	A	105.	D
10.	D	58.	A	106.	C
11.	A	59.	C	107.	C
12.	B	60.	D	108.	B
13.	D	61.	D	109.	A
14.	B	62.	A	110.	B
15.	D	63.	C	111.	C

16. D
17. C
18. A
19. B
20. D
21. B
22. B
23. C
24. D
25. B
26. B
27. B
28. A
29. A
30. C
31. E
32. C
33. D
34. F
35. G
36. B
37. A
38. F
39. D
40. B
41. E
42. G
43. J
44. I
45. H
46. C
47. D
48. B

64. D
65. A
66. B
67. C
68. A
69. D
70. A
71. C
72. B
73. C
74. D
75. C
76. B
77. D
78. B
79. B
80. B
81. A
82. C
83. B
84. D
85. D
86. B
87. C
88. B
89. B
90. C
91. C
92. C
93. D
94. B
95. A
96. D

112. D
113. D
114. B
115. D
116. B
117. A
118. P
119. F
120. B
121. M
122. Q
123. D
124. C
125. J
126. K
127. G
128. C
129. A
130. A
131. C
132. D
133. B
134. D
135. B
136. C
137. D
138. D
139. A
140. B
141. A
142. B
143. B
144. D

Phlebotomy Applications

Part II. Case Application provides a section with simulated cases and scenarios designed to make you exercise critical thinking skills while making decisions and solving problems. This requires you to apply situational judgment as you work through reality-based situations. If you have trouble with these cases, you may need more practical experience so that you can apply what you have learned.

Case 1

Infection Control, Universal Precautions and Safety

You are asked to draw blood samples from a patient known to have active Tuberculosis. He is an inpatient in a hospital where you work. He doesn't look very sick, but he does cough a lot. A sign on the patient door designates that this patient is in respiratory isolation.

Review Questions

1. What does respiratory isolation mean?

2. How do you proceed?

3. What precautions should you take during the draw?

4. What precautions should you take when handling the sample?

5. Should you clean this patient's arm with something besides alcohol because he is in isolation?

Case 2a

Anatomy and Physiology of Circulatory System

You are called to the Emergency Department to draw a STAT CBC, LYTES, and BILI from a 33-year-old male who appears very ill. You notice that the whites of his eyes are almost yellow, as is his skin tone, and that he is very weak. He has an IV running in his left hand.

Review Questions

1. Where do you look first to find a vein?

2. What tubes do you draw?

3. What do these tests typically check?

4. What diagnosis might be among those the Dr. is considering?

5. What might these combinations of laboratory tests typically check?
    a. Creatinine, BUN, routine urinalysis

    b. PTT, APTT, ProTime, Platelet count

    c. Alk P'tase, Calcium, LD

    d. Hemoglobin and Hematocrit

    e. Troponin and CK-MB

Case 2b

Major Body Systems

Your grandfather has just returned from the doctor's office and is trying to remember what the physician told him. He went to the doctor because he was coughing up blood. He tells you that the doctor is doing a battery of tests on one of his major body systems, but that it is a long word and he can't quite remember which one it is. He says it has something to do with his breathing.

Review Questions

1. Which body systems does he mean?

2. What other major systems are there?

3. Which veins of the circulatory system are most commonly used for venipuncture?

4. Which finger(s) is/are most commonly used for microsampling?

5. What part of an infant foot is used for microsampling?

6. What type of patient can NOT be drawn in the leg or foot?

Case 2c

Related Medical Terms

This is not really a case, but a practice chart for determining which laboratory related terms or abbreviations you will need to review from your favorite resource(s). Use your favorite phlebotomy references or medical dictionary to help you. Make notes to yourself that help you remember important ideas about each term or phrase. Some examples of appropriate review notes (written by a practicing phlebotomist) will be included so that you can see how to use it for study purposes.

Terms	Why do you need to know this term/phrase?
Needle Gauge	*Example: Gauge=Diameter; Smaller gauge=fatter needle*
Sterile	
Waived Tests	*Example: Lowest level of lab tests according to CLIA*

Clotting Factors	
Hemolysis	
Centrifuge	
Iodine	
Septicemia	
Bacteremia	
Glucosuria	*Example: "uria" at the end of a word means "in urine"*
Anemia	
Hematocrit	
Basilic	
Diabetes	
Antibody	
Patients' Bill of Rights	
Fasting	
Malpractice	
Venule	
Hemoglobin	
Time Dependent	
Natremia (hypo/hyper)	*Example: Na=Sodium & "emia"=in the blood*
Median Cubital	
Vaccination	
Evacuated Drawing Tubes	
Tourniquet	

Electrolytes	
Hematuria	
Medical Ethics	
Palpate	
Disinfectant	
Hemostasis	
Inflammation	
Infection	
Human Chorionic Gonadotropin	
Potassium & Kalemia (hypo/hyper)	
Outpatient	
Systolic Pressure	
Capillary	
Arteriole	*Example: The smallest type of artery*
Antibiotic	
Ulna	

Coagulation	
Cholesterol	
Artery	
Aseptic	
Inpatient	
Bilirubin	
Vein	

Negligence	
Differential Smear	
Jugular	*Example: Prominent vein in the neck*
Microorganisms	
Nosocomial Infection	
Diastolic Pressure	
Blood Culture	

Abbreviations	What does this stand for?
ABY Screen	*Example: Antibody screen (a Blood Bank test)*
AIDS	
Anat or Clin Path	
APTT	
BILI, Dir and Total	
BMT	
BP	
CAP	

CBC	
Cl-	
CLIA	*Example: Clinical Laboratory Improvement Amendment*
CO2	
DIFF	
dL	
EDTA	

EMLA	
FFP	
FUO	
G Force	
GLUC	
GTT	
HbG of HB	
HBV	
HCG	
HCT	
HIPAA	
Hrs PP	
HTLV	
IV	
JCAHO	*Example: "Joint Commission" regulates hospitals*
K+	

LYTES	
MI	
mL	
MONO	
MSDS	
Na	*Example: Na is the chemical abbreviation for sodium*
Na Citrate	

Na Fluoride	
Na Heparin	
Na Oxalate	
CLSI	
OSHA	
Packed RBCs	
pH	
PLT	
POCT	
POL	
PPE	
ProTime	*Example: Prothrombin Time/ tests extrinsic coag factors*
PTT	
QA	
QC	
QNS	

RBC	
RCF	
RhoGam	
RT	
Temp	
Type & Xmatch	
UA	

UTI	*Example: Urinary Tract Infection*
WBC	

<u>Case 3</u>

Proper Identification of Patients and Samples

Importance of Accuracy in Patient Care

Your fellow phlebotomist brings in a serum tube that he has just collected and labeled as "John Jones". You have been faxed on set of lab test orders for a Glucose test on John H. Jones and another set of lab orders for a Calcium level on John M. Jones. You ask your friend which Jones he drew. He says that it doesn't really matter since both need serum tubes anyway. This is the label on the tube:

Patient Name:	**John Jones**
Date of Birth (Outpt)	**11-21-1949**
Collected by: **KB**	Date: **7/11/04**
Time of Collection:	**0935 hrs**
Test(s) Ordered:	**Glucose**

Review Questions:

1. Is your friend correct that it doesn't matter which tube is sent to the lab?

2. What is your next step?

3. What is often considered the single most important step in blood collection?

4. What could have been done to prevent any mix-up?

5. What other forms of numeric identifiers can be used?

Case 4

Proper Selection and Preparation of Skin Puncture Sites, including Selection of Disinfectants

You will be performing venipunctures on three patients in a row. The first patient has orders for Electrolytes only. The second patient has a blood culture ordered. Your last patient has a CBC ordered. You wash your hands and put on new gloves before drawing your first patient. You take off your gloves, fill out some paperwork, and then go back to draw your second patient's blood work. You grab a new pair of gloves and perform the blood culture draw. You discard the gloves when finished and move towards your third and final patient. After f=greeting her, you look for another new pair of gloves.

Review Questions:

1. How are you doing so far with respect to following Universal Precautions?

2. What should you do before drawing patient number three?

3. How would cleansing the draw site differ between patients 1 and 2?

4. What are Universal Precautions?

5. What color tube tops are generally drawn for cultures?

Case 5

Blood Collection Equipment; Types of Tubes; Additives; Order of Draw; Special Precautions

Here is a partial list of equipment on your drawing tray:

21 gauge needles (for syringes and multisample adapters)
23 gauge needles (for syringes and multisample adapters)
Microsampling lancets
Adult size red and speckled tops, lavender top, light blue top, and green top tubes
Pedi-red and Pedi-lavender top tubes
Syringes
Assorted Microtainer tubes

Review Questions

1. What would you consider using to draw a CBC order on a 5-year-old?

2. What would you consider using to draw a Creatinine on a 45-year-old male with huge veins?

3. What would you consider using to draw blood from an infant heel?

4. What are the medical terms for the smallest veins and arteries?

5. What happens if you use a drawing device with excessive vacuum on a patient with a very thin and fragile vein?

6. If you had to draw both the red and lavender tops on a single patient, which do you draw first? What is the order of draw for all tube top colors?

7. What additives are in which tubes?

Case 6

Appropriate Disposal of Sharps, Needles & Waste

After drawing a blood sample on Mrs. Baxter in the hospital, you discard your needle in an approved sharp's container on your tray and finish up your paperwork. As you are about to leave the room, you notice a capped needle on the floor next to Mrs. Baxter's bed, some obviously "used" gloves (turned inside out) close by, and some liquid spilled on the floor. It looks like water but you aren't sure.

Review Questions

1. What might be your course of action?

2. Containers that are used to dispose of sharps should have what characteristics?

3. If you accidentally stick yourself with the needle as you pick it up, how would you clean your wound?

4. Can you name at least three laws or regulations that govern safe practices for phlebotomy? What do they address?

5. As you leave, you notice that your tube adapter has been visibly contaminated with patient's blood. Where should you dispose of it?

Case 7

Advanced Infectious Disease Control and Biohazard Handling

You are asked to speak to a class of biology students about your career in phlebotomy, the teacher wants you to address the following key points in your presentation:

- Your risk of catching diseases from your patients
- Your risk of spreading diseases from patient to patient
- Your patient's risk of catching disease from you

Review Questions

1. How do you address the key points?

2. If a patient acquires an infection while hospitalized that s/he did not have prior to hospital admission, what do you call it?

3. What preventative measure can decrease the chance of acquiring Hepatitis B from contaminated serum or blood products?

Case 8

Anticoagulation and Coagulation

Mrs. Bledsoe enters the hospital with orders for Prothrombin Time and Partial Thromboplastin Time tests. As the blue top tube is filling with blood, the physician enters the room and asks also that you draw a CBC, DIFF, and Type and Crossmatch.

Review Questions

1. What tube or tubes were you originally drawing for the PT and PTT?

2. What tubes would be needed for the new requests?

3. Can they be added to the end of the first draw without hurting results?

4. How is a DIFF prepared?

5. Why would a Type and Crossmatch be ordered?

6. Can you explain why a patient's blood does not normally clot as it is flowing through the patient's bloodstream?

7. Can you explain how a "cut" heals itself?

Case 9

Pre-Analytical Sources of Sample Errors
During Collection, Transport, Processing, and Storage

You find some urine and blood samples that have obviously gone unnoticed for quite a long while. A check of the sample collection time shows:

- A routine urinalysis sample that is 2 days old
- A blood sample with orders for Infectious Mono testing that is 8 hours old
- A blood sample with orders for a CBC that has been sitting for about 3 weeks

Review Questions

1. What should be your next step?

2. Why?

3. Does anyone need to track the cause? Why?

<u>Case 10</u>

Selection of Best Anatomic Site

For Blood Draw & patient Preparation Details

For each of these patients, explain anything "different" you would want to consider before drawing a blood sample.

Review Questions

What special consideration do you think about when drawing blood from a patient who—

1. – had a right side mastectomy yesterday?

2. – with a brand new hematoma (courtesy of your draw)?

3. – is an outpatient without an identification bracelet?

4. – has an IV in her left hand?

5. – needs a fingerstick and whose hands are freezing cold?

6. – weighs 432 pounds?

7. – is 5 years of age and is supposed to have Dilantin levels drawn?

8. – needs a Lipid Profile drawn?

9. – refuses to let you touch her?

10. – has no good arm/hand veins, but one in the left ankle?

Case 11
Risk Factor and Responding to Complications in Phlebotomy

Mr. Simpson is a 45-year-old male patient weighing 200 pounds who has come to the Outpatient Drawing Station for blood work. As you bring him back to have a blood sample drawn, he tells you that he "never really minds having blood drawn", but that sometimes he tends to "faint" afterward. He really doesn't look like the type to faint.

Review Questions

1. How would you react to the news?

2. Suppose you ignored the warning, left him in a chair for venipuncture, and then Mr. Simpson faints anyway. What do you do now?

3. Suppose he suddenly develops clammy skin, very shallow breathing, and a very rapid pulse. What might concern you?

Case 12

Quality Assurance in Phlebotomy;
Accuracy and Reliability in Test Results; and Legal Implications

You have test orders for blood work on a patient who is coming in later that afternoon. She will need about eight tubes of blood drawn. You decide to pre-label the tubes to save time. You put her name, the date of collection, and your initials on all the tubes and line them up in a test tube rack to be ready to go.

Review Questions

1. Is pre-labeling tubes considered good practice?

2. Are these tubes labeled correctly?

3. Why is pre-labeling NOT a good idea?

4. Who is legally responsible for labeling the patient sample correctly?

5. Why is it crucial to have the right patient with the right orders with the right labels for the right tests?

Case Answers

Case 1

1. It means that the patient can pass an infectious agent to you through his cough or droplet spray.
2. Put on a mask along with your usual PPE (personal protective equipment).
3. Avoid contact either droplet spray if possible (i.e. coughing in face).
4. Handle carefully, as per Universal Precautions. Avoid breakage. If required to open the sample tube at any time, do so under a hood.
5. No. Alcohol is still just fine.

Case 2a

1. The right arm
2. 1 lavender top for the CBC; plus a red topped tube*

*Although serum tubes (red or speckled) would be usually drawn for the others, for a STAT, many labs will ask for green top tubes as they can be spun and used without waiting for a clot

3. LYTES= checks electrolyte balance of blood stream
   CBC= Complete Blood Count provides cell counts, hemoglobin (Hb), hematocrit (Hct), and other tests for things like anemia
   BILI= Bilirubin levels check liver function
4. Hepatits (from the yellow tinge to his eyes and skin)
5. a. Renal (kidney) function
   b. Coagulation function
   c. Bone
   d. Anemias
   e. To determine if a patient had a myocardial infarction (MI), i.e. heart attack

Case 2b

1. Respiratory
2. Skeletal (bones and joints), Integumentary (skin, hair, nails, teeth, etc), Muscular, Nervous, Digestive, Urinary, Reproductive, Endocrine, Lymph, Cardiovascular (including Circulatory System)
3. Median cubital, cephalic, and basilic
4. Tip of the 3rd or 4th finger (Thumb is finger 1)
5. Most medial or lateral section of the plantar, or bottom, surface of the heel should be used
6. Heart (cardiac) patients

Key to Terms

Terms	Why do you need to know this term/phrase?
Needle Gauge	*Gauge=Diameter; Smaller gauge=fatter needle*
Sterile	*Without contamination by microorganisms—as in, a sterile surgical field*
Waived Tests	*Lowest level of lab tests according to CLIA*
Clotting Factors	*13 major and many minor proteins in the blood that help a patient clot (help coagulation occur)*
Hemolysis	*The "lysis" or bursting of red blood cells, which causes serum or place to look clear red or pink. Ruins potassium tests.*
Centrifuge	*An instrument that spins blood samples to separate cells from liquid.*
Iodine	*An antiseptic sometimes used in drawing blood cultures.*
Septicemia	*Infection in the blood*
Bacteremia	*Bacteria in the blood*
Glucosuria	*Glucose in the urine: "uria" at the end of a word means "in urine"*
Anemia	*Literally means "without blood" but refers to a condition when red blood cells aren't able to deliver enough oxygen to the tissues*
Hematocrit	*A calculation of the % RBC per whole colume of blood, usually per 100 ml.*
Basilic	*A vessel of the forearm sometimes used for venipuncture*
Diabetes	*Diabetes mellitus is a disease in which sugars can't be broken down due to an insulin problem*
Antibody	*A substance that can be made in the blood in response to exposure to an antigen*
Patients' Bill of Rights	*An extension of the American Hospital Associations pledge to protect patients when under medical care*
Fasting	*Not eating of drinking*

Malpractice	*Intentional wrongdoing*
Venule	*The name for the smallest veins*
Hemoglobin	*The chemical inside RBCs that carries oxygen to tissue*
Time Dependent	*A test that is time dependent must be drawn at specified times, i.e. after a drug is administered, or at certain times of the day, etc. as results will vary over time*
Natremia (hypo/hyper)	*Na=Sodium & "emia"=in the blood*
Median Cubital	*The vein most commonly accessed in the adult arm for venipuncture*
Vaccination	*An injection that provides protection from infection with microorganisms*
Evacuated Drawing Tubes	*Vacutainers or blood collection tubes*
Tourniquet	
Electrolytes	*The cations and anions that are found in the blood; K+, Na+, CO2, Cl-, and more*
Hematuria	*The presence of blood in urine*
Medical Ethics	*The study of right and wrong action in a medical issue*
Palpate	*To tap with light pressure, i.e. locating a good vein for venipuncture*
Disinfectant	*A chemical that can be used on a surface to kill or remove pathogenic (disease causing) organisms*
Hemostasis	*Blood stoppage*
Inflammation	*Collection of WBCs that forms redness or oozing, usually indicating infection*
Infection	*Collection of microorganisms that cause disease*
Human Chorionic Gonadotropin	*Hormone produced by the placenta during pregnancy and found in both urine and blood*
Potassium & Kalemia (hypo/hyper)	*Kalemia=Potassium in blood* *Hypo= not enough Hyper= too much*
Outpatient	*Patients who are not admitted to hospitals for overnight stays but are treated and released*
Systolic Pressure	*The working pressure*
Capillary	*The smallest vessels that connect the arteriole to the venous system*
Arteriole	*The smallest type of artery*
Antibiotic	*Medicine that can be used to fight infection with bacteria*
Ulna	*The bone located in the upper extremity that joins with the radius to form the forearm*
Coagulation	*A phase in the blood clotting sequence in which factors are released and interact to form a clot*
Cholesterol	*A type of fat or lipid in the bloodstream*
Artery	*A vessel that moves blood away from the heart*
Aseptic	*Literally "without sepsis" or without infection*
Inpatient	*A patient who stays overnight in a hospital*
Bilirubin	*A normal by-product of RBC aging that can cause problems if abnormally high. When collected, it should be kept from light as it breaks it down.*
Vein	*A vessel that moves blood to the heart*
Negligence	*A legal term referring to the failure to act or perform duties according to the standards of the profession*
Differential Smear	*A drop of whole blood that is spread along a glass slide to produce a field of cells that is one cell thick, so that the cells can be observed and counted after staining.*
Jugular	*Prominent vein in the neck*

Microorganisms	*Any living organisms that are microscopic in size, i.e. you need a microscope to see them (bacteria, fungi, some parasites…)*
Nosocomial Infection	*An infection that a patient acquires while in a hospital setting is called a nosocomial infection*
Diastolic Pressure	*The resting, or second, blood pressure reading*
Blood Culture	*A method for growing an infectious microorganism found in patient blood, to determine its identity.*

Abbreviations	What does this stand for?
ABY Screen	*Antibody screen (a Blood Bank test)*
AIDS	*Acquired Immune Deficiency Syndrome*
Anat or Clin Path	*Anatomic or Clinical Pathology*
APTT	*Automated Partial Thromboplastin Time*
BILI, Dir and Total	*Bilirubin, Direct and Total*
BMT	*Bone Marrow Transplant*
BP	*Blood Pressure*
CAP	*College of American Pathologists*
CBC	*Complete Blood Count*
Cl-	*Chloride (ionic)*
CLIA	*Clinical Laboratory Improvement Amendment- the law that regulates human testing*
CO2	*Carbon Dioxide*
DIFF	*A differential blood smear*
dL	*Deciliter = 100ml or 0.1 liter*
EDTA	*Ethylenediamine Tetra-acetic Acid: the anticoagulant in lavender top blood collection tubes, used for CBC*
EMLA	*Eutectic Mixture of Local Anesthetics (an emulsion that can be applied to skin to deaden pain – useful for little children*
FFP	*Fresh Frozen Plasma*
FUO	*Hever of Unknown Origin*
G Force	*Gravitational Force*
GLUC	*Glucose*
GTT	*Glucose Tolerance Test*
HbG of HB	*Hemoglobin – carries oxygen inside the red blood cells*
HBV	*Hepatitis B virus*
HCG	*Human Chorionic Gonadotropin = hormone secreted in pregnancy*
HCT	*Hematocrit = % of packed RBCs per 100 ml of whole blood*
HIPAA	*Health Insurance Portability & Accountability Act – protects the security & confidentiality of electronic health information*
Hrs PP	*Hours post-prandial (after eating)*
HTLV	*Virus associated with AIDS*
IV	*Intravenous – within the veins*
JCAHO	*"Joint Commission" regulates hospitals and provides standards (i.e. Patient Safety 2004)*
K+	*Potassium (ionic)*
LYTES	*Electrolytes (Na, K, Cl, CO2 are the major four)*
MI	*Myocardial Infarction = heart attack*

mL	*Milliliter = 1/1000 liter*
MONO	*Infectious Mononucleosis abbrev.*
MSDS	*Material Safety Data Sheets*
Na	*Na is the chemical abbreviation for sodium*
Na Citrate	*Sodium Citrate= an anticoagulant in blue top tubes*
Na Fluoride	*Sodium Fluoride= an anticoagulant that inhibits glycolysis*
Na Heparin	*Sodium Heparin= an anticoagulant in green top tubes*
Na Oxalate	*Sodium Oxalate= an anticoagulant in black topped tubes*
CLSI	*Clinical Laboratory Standards Institute—recommends quality standards and guidelines for clinical laboratory procedures*
OSHA	*Occupational Safety and Health Administration that regulates safe work practices*
Packed RBCs	*Red Blood Cells with the plasma removed as much as possible*
pH	*A number that indicates how much a chemical solution is acid or base in nature; the lower the number, the more acidic.* *Water is 7 = neutral Ammonia is above 7*
PLT	*Platelet= cellular component of blood that forms a plug needed to stop bleeding in humans*
POCT	*Point of Care Testing = Testing performed at the patient's side rather than sent off to a lab (e.g. sugar, urinalysis, cholesterol)*
POL	*Physician Office Laboratories*
PPE	*Personal Protective Equipment= Required by OSHA for safe work; in lab, this includes gloves, lab coat, goggles, etc.*
ProTime	*Prothrombin Time/ tests extrinsic coagulation factors*
PTT	*Partial Thromboplastin Time = like APTT* *Tests intrinsic and common coagulation factors*
QA	*Quality Assurance=systematic method for insuring accuracy and validity in testing*
QC	*Quality Control= practices that are used as part of the the overall AQ effort (e.g. running normal and abnormal patients)*
QNS	*Quantity Not Sufficient = there is not enough blood to do the test*
RBC	*Red Blood Cell = the cell that uses its hemoglobin to carry oxygen to the tissue*
RCF	*Relative Cetrifugal Force= what a centrifuge measures in "G" or gravitational units; the force exerted from the center out…*
RhoGam	*RhO gamma globulin= given to women of childbearing age after delivery or abortion if they are Rh-, to prevent them from forming Rh antibodies that might harm future pregnancies*
RT	*Room Temperature = 25 degrees C*
Temp	*Temperature*
Type & Xmatch	*Type and Crossmatch=the act of determine the ABO group and Rh type of a patient, and finding units of blood that are compatible*
UA	*Urinalysis*
UTI	*Urinary Tract Infection*
WBC	*White Blood Cells = the cellular component of blood that fights infection*

Case 3

1. No. Patient Identification always matters. It's a #1 concern.

2. Check with Mr. Jones if he is still there. Ask for his middle initial. You already have his "numeric identifier", so you should check that as well. Unless they are both born on the same date, you should have your man.
3. Patient ID; correct labels are a related second – without the right patient, even if everything else is done perfectly, the lab test results are of no value.
4. Getting a middle initial or middle name never hurts, especially if people have common surnames, like Jones or Smith.
5. Some outpatient sites will allow Social Security numbers to be used in identification. Inpatient hospital numbers are the preferred numeric identifiers for patients admitted to hospitals. They must match number for number. If they do not, blood cannot be drawn.

Case 4

1. Not well. You forgot to wash your hands in between patients. Changing gloves alone is not enough.
2. Wash your hands.
3. You use alcohol alone to disinfect a normal venipuncture site and allow it to air dry. You use alcohol followed by iodine to disinfect a blood culture draw site, in an effort to make it as sterile as possible. You disinfect in a circular fashion from the inside out (from the center to the periphery of the circle). You are careful to allow each step to air dry. Blowing on any draw site is not allowed! This is repeated 3 times for blood culture draws. (Note: Chlorhexidane can also be used for blood cultures.)
4. Treating all patient samples as if they are both hazardous and infectious, and capable of transmitting something you don't want, is the basis for the philosophy of safety known as using "Universal Precautions". Be treating all samples the same and handling them all with standard precautions, we are protected from the most infectious and hazardous agents just like any other.
5. Yellow

Case 5

1. 23 gauge needle and the pedi-lavender top tube; maybe the syringe if needed (**the higher the gauge number, the smaller the needle bore)
2. 21 gauge needle and an adult speckled top tube
3. Lancet, less than 2.0 mm tip and microtainers
4. Venules and Arterioles
5. The vessel may collapse under the pressure; might consider a syringe draw to control the amount of vacuum exerted
6. Draw red first, then lavender (since it has an additive). The tube order recommended by CLSI* is blood culture tubes/bottles; coagulation tube (light blue); serum tube with or without clot activator (red, gold, or red/black); heparin with or without gel plasma separator (green); EDTA (lavender or pink); and glycolytic inhibitor (gray); yellow top (A or B) ACD tubes; all others.
   *Clinical and Laboratory Standards Institute
7. Red top = nothing; speckled (gray and red) polymer barrier

Lavender top = EDTA
Light Blue top = Sodium Citrate
Green = Heparin
Gray = Potassium Oxalate &/or Sodium Fluoride

Case 6

1. Depending upon the location of the items on the floor to your own location, you would assess the needs that should be addressed first. If the needle is close, you might very carefully pick it up and dispose of it in your own sharps container.

   Next, you would assess the spill danger. You would want to make sure that no one would slip on the spilled liquid, including yourself, the patient, and any visitors – while awaiting cleanup. You must assume the liquid is hazardous since you do not know its origin, and whoever cleans the spill must use universal precautions.

   Finally, with gloved hands, you could pick up the used gloves and dispose of them as you would your own.
2. They must be spill-proof, tamper proof, and puncture resistant.
3. You could bleed the wound slightly and then clean it with soap and water or an alcohol swab.
4. OSHA (universal precautions, etc.); Right to Know law (MSDS sheets); JCAHO regulations for patient and employee safety.
5. Try the nearest biohazard waste container.

Case 7

1. Key Points

- Some risk, but kept low because of the use of universal precautions and isolation procedures as needed. One of the greatest risks for laboratory workers is hepatitis B, although people hear more in the news about the risk of AIDS.
- The spread of disease from patient to patient is very possible unless universal precautions are used. The single most important thing that will work to prevent such transfer is handwashing between each patient, followed by the use of gloves.
- Working while fighting an illness (any communicable disease or illness) is never advised for any health care worker. Respiratory or skin diseases would be among the most easily spread. Because of that, there is very little risk of the patient catching anything from the phlebotomist who responsibly stays home while ill.

2. Nosocomial infection
3. Hepatitis B vaccination

Case 8

1. Blue top(s)
2. Lavender top for the CBC; an additional red for the Crossmatch (and some people might want another lavender for typing); several glass slides for the DIFF.
3. Obviously, it would have been better to have drawn any tube without an additive first, to avoid cross contamination. The phlebotomist could draw a very small amount of blood into a discard tube in between the first and second tubes to decrease the risk of contamination from the sodium citrate in the blue top tube.
4. Using two glass slides, one at a 30-degree angle to the other, spread a drop of the patient's unclotted blood along one slide until a film of approximately 1 cell in thickness is produced. A

nice feathered edge is helpful, and a smear that covers about 2/3 of the slide surface makes it easier for the cells to be counted under the microscope.

5. The patient may need surgery or may require a blood transfusion.
6. Blood flows freely in the bloodstream unless the coagulation mechanism is activated for some reason.
7. When skin is "cut", "tissue factors" activate the extrinsic clotting system that is measured by the Prothrombin Time (ProTime) test. The coagulation factors interact in a sequence that is known and predictable. At the same time, platelets form a plug to shore up the vessel break until the body can do more permanent repairs. This also activates the "intrinsic" coagulation pathway, and sets yet another series of coagulation factors to work activating one another in sequence that can be tested by an APTT. Together, the intrinsic and extrinsic pathways of coagulation combine to activate a common pathway, which eventually leads to the conversion of Prothrombin to Thrombin. Thrombin then activates Fibrinogen to form Fibrin – which is the framework for the formation of a more permanent plug – which remains until tissue repair is complete. Calcium is needed for this to occur, which is why blood does not clot in the presence of EDTA, as it binds up all the calcium

   There is also a natural body system for getting rid of products of clotting or coagulation. This is called the fibrin-lysis or fibrinolytic system.

Case 9

1. You can call the laboratory Clinical Laboratory Scientists or Medical Technologists for advice, or look in a service directory, to determine specimen collection requirements for the three tests ordered. They may perform the Mono test, but ask for recollection for the others. Make sure the draw time is easily noted in any case.
2. A test result is only as good as the sample upon which it is performed. If the sample is too old, it won't five the same results as a fresh one and the patient might get the wrong treatment or diagnosis.
3. YES. This is just plain good Quality practice. Controlling the quality of each step in the collection and performance of laboratory tests is crucial. Obviously, this process has a flaw—these samples were somehow overlooked for days or weeks. The process must be fixed so that it won't happen again. We wouldn't investigate to place blame, but to make the process work better.

Case 10

You would consider—

1. Not drawing from the right side
2. Applying steady pressure on the hematoma until it is no longer swelling, and then using the other arm
3. What other numeric identifier you will get to insure you have the right patient, with attention to all names (first, middle, last and initials) as well; birthdate and Social Security Numbers would help.
4. Not drawing anywhere above the IV in her left arm
5. Using a pre-warming technique
6. Asking the patient where people have had the most success if no vein can be palpated, or considering a finger stick if no veins are palpable.
7. Asking the nurse when the patient last had Dilantin, and use soothing and reassuring styles of communication to lessen the child's fear and to insure that s/he will cooperate as much as possible. You will also note bed rail positions and put them back.

8. Has he been fasting 8-12 hours?
9. Nothing. You can try to talk her into it, but she ultimately has the right to refuse treatment.
10. Check with the doctor to see that he is not a heart patient, for whom leg draws are not usually advised. They are also not advised in patients with diabetes or coagulation disorders. Always seek physician approval beforehand.

Case 11

1. Take it seriously. It doesn't matter whether you believe he will faint. The safest thing to do is place him in a reclining position for the draw.
2. Protect the patient from harm. Try to keep him from falling and injuring himself further. Make sure to remove the tourniquet and needle as safely as possible. Help to move him into a position to get blood circulating to his head as quickly as possible. A cold compress will help. Get medical assistance as needed.
3. Those are some of the symptoms of shock. You would seek medical help as quickly as possible.

Case 12

1. NO!!!!!!!!!!
2. No; they also need a numeric identifier (#) and the time of collection as well.
3. What if the patient doesn't show up? What if they are accidently picked up and used on another patient? What if you go home and someone else draws the blood? If no one used them, you'd waste them or have to try to remove the old labels.
4. The phlebotomist who draws the sample, and whose initials are on the paperwork.
5. The patient's diagnosis and/or treatment may depend upon it.