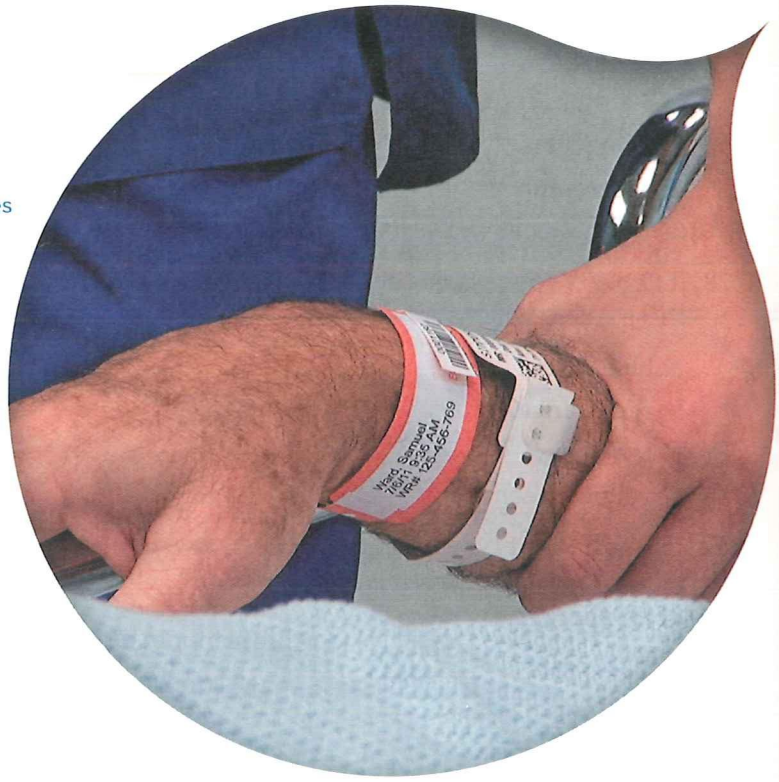
7 Patient and Specimen Requirements

essential terms

accession number
ambulatory
analyte
ASAP
assault
basal state
battery
bedside manner
code of ethics
confidentiality
diurnal variation
electronic health record (EHR)
electronic medical record (EMR)
ethics
expressed consent
fasting
Health Insurance Portability and Accountability Act (HIPAA)
hemoconcentration
hemodilution
implied consent
informed consent
interfering substances
law
lipemic
malpractice
negligence
peak level
postprandial
rapport
requisition
respondeat superior
sedentary
STAT (ST)
therapeutic drug monitoring (TDM)
trough level



McGraw-Hill Education/Take One Digital Media, photographer

Learning Outcomes

7.1 Identify the parts and functions of a laboratory requisition.

7.2 Identify the professional communication techniques of the phlebotomist.

7.3 Comply with ethical and legal standards for professional communication.

7.4 Carry out proper patient identification.

7.5 Define the legal/ethical importance of specimen identification.

7.6 Recognize patient factors that may affect specimen quality and test results.

7.7 Explain the phlebotomist's role in maintaining accurate and secure blood collection documentation.

Related NAACLS Competencies

4.1 Demonstrate understanding of the importance of specimen collection and specimen integrity in the delivery of patient care.

4.2 Describe the legal and ethical importance of proper patient/sample identification.

4.3 Describe the types of patient specimens that are analyzed in the clinical laboratory.

4.4 Define the phlebotomist's role in collecting and/or transporting these specimens to the laboratory.

4.5 List the general criteria for suitability of a specimen for analysis, and reasons for specimen rejection or re-collection.

4.6 Explain the importance of timed, fasting, and STAT specimens, as related to specimen integrity and patient care.

7.1 Demonstrate understanding of requisitioning, specimen transport, and specimen processing.

7.2 Describe the process by which a request for a laboratory test is generated.

7.3 Instruct patients in the proper collection and preservation for nonblood specimens.

9.5 Demonstrate an understanding of the major points of the American Hospital Association's Patient's Bill of Rights and the Patient's Bill of Rights from the workplace.

9.6 Comply with the American Hospital Association's Patient's Bill of Rights and the Patient's Bill of Rights from the workplace (Patient Care Partnership).

9.9 Define and use medicolegal terms and discuss policies and protocol designed to avoid medicolegal problems.

9.11 Demonstrate basic understanding of age specific or psychosocial considerations involved in the performance of phlebotomy procedures on various age groups of patients.

Introduction

This chapter explains how orders for laboratory tests are generated, the skills needed for professional communication with the patient, and the identification required for both the patient and the specimen. The chapter also offers insights into the effect of certain patient situations on the laboratory results and describes how specimen collection is documented and tracked in the electronic health record.

7.1 Laboratory Requisitions

The phlebotomy procedure begins when a physician or other qualified healthcare practitioner orders blood or other laboratory tests to be performed. The order may be entered on an inpatient's chart, **electronic medical record (EMR),** or **electronic health record (EHR),** which may interact with facility-wide computer systems (see Figure 7-1). Many inpatient facilities require that the healthcare practitioner enter laboratory test requests directly into the hospital information system (HIS) or laboratory information system (LIS). In most facilities, this is called computerized physician order entry, or CPOE.

If the patient is an outpatient, the order for laboratory tests may be written as a prescription requested on an official **requisition** form (see Figure 7-2), telephoned to the laboratory by the physician or office staff, or faxed to the laboratory from the physician office. In addition, some laboratories have provided physician offices with access to the LIS for the purpose of ordering tests and accessing results. In this case, the physician offices are called *clients.*

In many healthcare facilities, when a laboratory test is ordered it is entered into a computer at the patient care station (part of the HIS). The computer in the laboratory (part of the LIS) receives the order and provides an **accession number** (a number assigned sequentially in the order received). This accession number is usually a Julian date (the day of the year) followed by the test number. The LIS then prints the requisition, in the form of labels, for the phlebotomist to use. Figure 7-3 shows the Julian date as the fourth day of the year (004) in the year 2011 (11-). The Julian date is followed by the number 002085, which indicates that this test is the 2085th test ordered on that day.

Figure 7-1 Patient information may be maintained in a hard copy file or entered into a computer system, or both.
Arthur Tilley/Getty Images

00000530962

Sample Laboratory Requisition

Please Indicate Bill Type Below
Attach Copy of Insurance Card

Patient Data (Please Print)

Last Name | First Name | Maiden Name

Address | Apt No

City | State | Zip

SS# | Phone #

Date of Birth (Month, Day, Year) | ☐ Male ☐ Female | Date Collected | Time Collected | a.m. p.m.

Physician 1 | Physician 2

Billing Information (Please Print Clearly)

Please Bill to: ☐ Dr. Account (Client) ☐ Patient Self Pay ☐ Insurance Co

Responsible Party (Last, First) | Relationship to Subscriber ☐ Self ☐ Child ☐ Spouse ☐ Other

Primary Insurance Co. Name | HMO ☐ | PPO ☐

Insurance Policy # | Insurance Group #

Primary Insurance Co. Address (Street, City, State, Zip)

Insured Date of Birth | Insured SS#

PLEASE PROVIDE MANDATORY ICD CODE BELOW

1	2	3	4	5

CALL TEST RESULTS TO:

Test: _____
To: _____
Phone: ( ) _____

FAX RESULTS TO:

To: _____
Fax: ( ) _____

☐ Veni Tech Code _____ Tubes Received _____

Please (X) desired Panel(s) / Profile(s) / Tests. See back of requisition for profile components.

PANELS/PROFILES

☐ **Hepatitis Panel, Acute**	2S
☐ Basic Metabolic Panel	MT
☐ Comp Metabolic Panel	MT
☐ Electrolyte Panel (Lytes)	MT
☐ Hepatic Function Panel	MT
☐ General Health Panel	MTL
☐ **Lipid Panel**	MT
☐ Obstetric Panel AMH	P2SL
☐ Renal Panel	MT

MICROBIOLOGY

Source of Specimen:

☐ Culture, Anaerobe	
☐ Chlamydia/GC Amp Probe	
☐ Culture, Ear	
☐ Culture, Eye	
☐ Leukocytes Stool	
☐ Culture, Fungal	
☐ Culture, Genital	
☐ Culture, Herpes	
☐ Occult Blood Screen	
☐ Ova & Parasites	
☐ Rapid Strep Throat	
☐ Culture, Stool	
☐ Culture, GROUP A BetaStrep Screen	
☐ Culture GROUP B Screen	
☐ Culture, Throat	
☐ **Culture, Urine**	
☐ Culture, Wound / Abscess	
☐ Culture, Viral	
☐ C. Difficile Toxin A&B AMH	

INDIVIDUAL TESTS

☐ ABO Group/RH	P
☐ **Acid Phosphatase, Prostatic**	S
☐ Albumin	MT
☐ Alkaline Phosphatase	MT
☐ Amylase	MT
☐ Antinuclear Antibodies (ANA Send)	S
☐ **HCG, Beta Quant**	MT
☐ Bilirubin T / D Neonate	A
☐ Bilirubin T / D Adult	MT
☐ **BNP Screen**	L
☐ BUN	MT
☐ **CA-125**	S
☐ **CA-125 to Dianon**	S
☐ CRP	MT
☐ CRP Cardio	MT
☐ **Calcium**	MT
☐ Carbamazepine/Tegretol	R
☐ **CBC & PLT w/o Diff**	L
☐ **CBC & PLT w Diff**	L
☐ **Carcino Embryonic Antigen (CEA)**	S
☐ **Cholesterol Total**	MT
☐ Cortisol Level	MT
☐ Creatine Kinase, Total (CK)	MT
☐ CPK total w CKMB	MT
☐ Creatinine Clearance	U
☐ Creatinine	MT
☐ D Dimer Quant	B
☐ DNA AB Double Strand	S
☐ **Digoxin Level**	R

INDIVIDUAL TESTS (cont.)

☐ **Drug Screen Urine**	U
☐ **Drug Screen Urine c Confirm**	U
☐ Estradiol Level	MT
☐ **Ferritin Level**	MT
☐ Fetal Fibronectin (FFN)	SWAB
☐ Folic Acid (PROTECT)	MT
☐ Follicle Stimulating Hormone	MT
☐ **GGT (Gamma Glut Trans)**	MT
☐ **Glucose**	MT
☐ **Glucose Fasting**	MT
☐ **Glucose Challenge 1° Preg**	MT
☐ **Glycosylated Hemoglobin (HA1C)**	L
☐ **Hepatitis B Surface AG**	S
☐ **Hepatitis B Surface AB**	S
☐ Hepatitis C Antibody	S
☐ Herpes Simplex I & 2 IgG AB	S
☐ Herpes Simplex I & 2 IgM AB	S
☐ **HIV I&II Abs**	S
☐ Homocysteine	L
☐ **Iron/TIBC**	MT
☐ Lactate Dehydrogenase (LDH)	MT
☐ Lipase	MT
☐ Lithium	R
☐ Luteinizing Hormone	MT
☐ Microalbumin Random/24 Hr.	U
☐ **Magnesium**	MT
☐ MONO test heterophile	S
☐ Phenobarbital	R
☐ Phenytoin/Dilantin	R
☐ **Phosphorous**	MT
☐ Potassium	MT
☐ Progesterone	S
☐ Prolactin	MT
☐ **PSA Free and Total**	S
☐ **PSA Screen (Medicare)**	S
☐ **PSA Diagnostic**	S
☐ **Prothrombin Time**	B
☐ **aPTT**	B
☐ **PTH Intact**	S
☐ Reticulocyte Count	L
☐ Rheumatoid Factor (RF)	MT
☐ **RPR QUAL**	S
☐ Rubella, IgG	S
☐ **ESR (Sed Rate)**	L
☐ SGOT (AST)	MT
☐ SGPT (ALT)	MT
☐ Testosterone	S
☐ Testosterone Free & Total	S
☐ **TSH**	MT
☐ **Total T3**	MT
☐ **T3 Uptake**	S
☐ **Free T3**	MT
☐ **Free Thyroxine (FT4)**	MT
☐ **Total T4**	S
☐ **Free Thyroxine Index (FTI)**	S
☐ Thyroid Antibodies	S
☐ **Troponin / Quant**	MT
☐ **Triglycerides**	MT
☐ Uric Acid	MT
☐ Urinalysis	U
☐ Valproic Acid / Depakote	R
☐ Vitamin B12 (PROTECT)	MT
☐ Vitamin D 25 Hydroxy	S

ADDITIONAL ORDERS

Figure 7-2 Physician office staff may use a laboratory requisition form to order tests for their patients. All required patient and specimen information must be included as well as billing information.

Some laboratories require separate requisitions for each department. These requisitions may be color-coded or numbered to identify the laboratory to which the specimen will be transported for analysis. The phlebotomist must be able to read and interpret requisition labels quickly and accurately.

Physician orders for laboratory tests will indicate the type of specimen and the time or priority of collection. Some specimens are ordered as **STAT (ST),** which means they must be collected and transported immediately. Specimens may also be referred to as **ASAP** (as soon as possible) or routine (RT), with collection times determined by the facility. Some laboratory tests require specific times for collection; these are referred to as timed tests, which will be discussed later in this chapter.

The phlebotomist is responsible for examining all requisitions carefully before leaving the laboratory to collect the specimen or before drawing blood from a patient. All requisitions must contain certain basic information to ensure that the specimen drawn and the reported test results are for the correct patient. Every requisition should contain the following information:

- Patient's name
- Patient's date of birth
- Patient's medical record number
- Patient's location (if inpatient)
- Ordering physician's name
- Type of test to be performed
- Test status (timed, fasting, STAT, and ASAP)
- Date and time the test is to be performed

In special testing conditions, additional information should be included. Special testing conditions include fasting (no food or liquids except water) prior to the draw and situations in which blood must be drawn at an exact time. These requirements are also included on the requisition form.

Other information may also appear on computer-generated requisitions because they are often used as specimen labels (see Figure 7-3). Additional information may include the following:

- Computerized bar code
- Laboratory accession number
- Type of anticoagulant tube required
- Volume required
- Laboratory section performing the test

The requirements for specimen labeling are discussed later in this chapter.

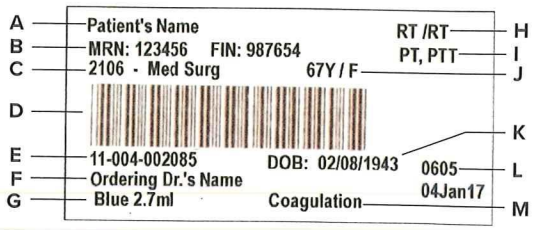


Figure 7-3 A laboratory test requisition may take the form of a computer-generated label and must contain the following: (A) patient's name, (B) patient's medical record number, (C) patient's location, (D) bar code, (E) laboratory accession number, (F) requesting physician, (G) blood volume and tube type, (H) test status, (I) test to be performed, (J) patient's age and sex, (K) patient's date of birth, (L) date and time the test is to be performed, and (M) laboratory section to which the specimen should be delivered.
Lillian Mundt

Checkpoint Questions 7.1

1. What information must requisitions for laboratory tests include?
2. Define the following: EHR, CPOE, and LIS.

7.2 Professional Communication

The phlebotomist must exhibit a certain level of confidence when working with patients. Just knowing how to perform the proper technique may not be sufficient. The patient may be anxious, combative, or have veins that are difficult to access. In such instances, self-confidence combined with experience in dealing with all kinds of patients provides the mindset required to successfully obtain the specimen on even the most difficult draws.

Greeting the Patient

The phlebotomist sets the tone for the venipuncture procedure when greeting the patient. Always smile and address the patient in a calm, pleasant tone of voice to gain the patient's confidence and trust. Behave as a professional. Show courtesy and respect for the patient. This is called **bedside manner** or **rapport.** Be aware of cultural differences that might make communication awkward. For example, direct eye contact may be considered disrespectful by individuals of certain cultures or backgrounds. Cultural diversity and professionalism are discussed further in the chapter *Practicing Professional Behavior.*

A pleasant and confident manner will help put the patient at ease and may help divert the patient's attention from the phlebotomy procedure. When greeting a patient, you should always identify yourself. In most cases, it is appropriate to state your first name only. A patient may become upset about treatment or become affectionate toward you and attempt to contact you outside the facility. For these reasons, many facilities recommend that phlebotomists simply identify themselves as from the lab. Check the policy of the facility where you are employed. In any case, after identifying yourself, be certain to state why you are there and what you will be doing. Remember, phlebotomists represent the laboratory profession.

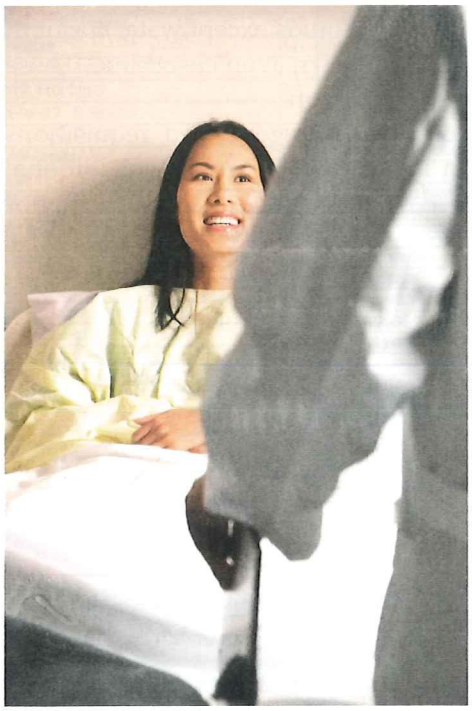


Figure 7-4 Greeting the patient in a professional manner instills confidence in the patient concerning phlebotomy skills.
©Plush Studios/Blend Images LLC

Greeting the patient properly is important for both inpatients and outpatients. Outpatient situations occur in hospitals and clinics, patients' homes, long-term healthcare facilities, and physician offices, among others. In an outpatient situation, the first few seconds are even more critical than with an inpatient. If a patient is in a hospital, it is not a surprise for a phlebotomist to arrive to collect a specimen. When a patient is not in a traditional hospital or clinic setting, a person arriving to collect a blood sample may not be expected. Your arrival may cause the patient to become anxious, so conducting yourself in a professional manner is essential in an outpatient setting.

Inpatients present different circumstances (see Figure 7-4). The doors to most patients' rooms are usually open. Whether a patient's door is closed or open, knock and wait for a response before entering. Some patients cannot respond,

especially if they are asleep, have been sedated, or have a medical appliance covering or inserted into their mouth. After waiting for a few seconds, open the door slowly and greet the patient before proceeding into the room. Even if the door is slightly ajar or open, it is still a good idea to knock lightly to make the patient aware that you are about to enter.

Special Considerations for Children

Life Span Considerations

In the healthcare field, discretion and common sense must be used at all times, but especially when dealing with children. The phlebotomy procedure usually frightens children. Never lie to patients (children or adults) by telling them, "This will not hurt." Even the most smoothly performed phlebotomy procedure will cause momentary discomfort. For children, it is best to keep them talking to distract them and then quickly proceed with the procedure. If they ask if it will hurt tell them the truth saying something like, "You will feel a little quick sting." Usually, a parent is present and can assist with the phlebotomy procedure and reassure the child. However, in some cases the parent will be anxious and may need to be comforted as well.

Because an adult usually accompanies the child in an outpatient setting, phlebotomists may approach identifying the child as they would an adult. If the child is too young or unable to respond to questions, ask the adult to verify the child's identity. For most purposes, the consent of a parent is enough informed consent to proceed with the procedure.

Sometimes the curtain is pulled around the patient's bed. Treat this situation in a similar manner. Talk to the patient through the curtain before pulling it back and entering. Taking this small extra step before entering the patient's room can save you and the patient embarrassment in the event the patient is undergoing a procedure or is using a bedpan or urinal. Following these steps will make the patient feel respected and will help create a positive setting for the phlebotomy procedure.

Special Considerations for Geriatric Patients

Life Span Considerations

Just as there are certain details to keep in mind when dealing with children in the phlebotomy setting, there are also special considerations for geriatric patients. Elderly patients may exhibit sensory impairment, such as loss of hearing or vision, that requires further patient preparation. However, do not assume that older adult patients cannot hear by automatically raising your voice. Hearing loss may require the phlebotomist to repeat questions and instructions. Phlebotomists may also encounter patients who are confused about where they are or why they are in the hospital or may need special assistance. In many cases, such as in a long-term care facility, the phlebotomist should inquire about recommendations for assistance or restrictions at the nursing station before entering. In an outpatient setting, a patient's loss of eyesight may require you to carefully guide the patient to the phlebotomy chair. Being patient and compassionate will make it easier to communicate with elderly patients.

Communicate & Connect

Wake the Patient Gently

At any time of the day, but especially during early morning blood collections, the patient may be asleep. Gently wake patients without startling them and explain why you are there (see Figure 7-5). Nudge the bed, instead of touching the patient. Talk in a soft manner and avoid turning on bright lights. Give patients the opportunity to shield their eyes before turning on a light. Never attempt to collect a specimen from a sleeping patient. The patient may wake suddenly and jerk the arm. This could potentially harm the patient or injure you.

Responding to Patient Questions

Patients often want to know the purpose of the blood tests requested by the healthcare provider and how much blood will be drawn. The best response is to state that the tests are routine tests ordered by the physician. If the patient needs more information about the tests, suggest that they speak with the physician directly.

Figure 7-5 Gently wake sleeping patients of any age before beginning procedures.
Purestock/SuperStock

The phlebotomist should not discuss the tests with the patient. For example, if the phlebotomist were to tell a pregnant woman that a test for syphilis (a sexually transmitted infection) was to be drawn, and this was the first she had heard of it, imagine the anxiety and panic this woman might feel, not to mention the doubt created toward her husband or significant other. It is the physician's responsibility, not the phlebotomist's, to discuss this information with the patient. In such cases, the phlebotomist might respond by saying, "You will need to ask your physician about these tests or results. I cannot discuss them with you."

Communicate & Connect

Patient Interaction

Patients often do not feel well. They may be angry or scared about their medical condition, and, as a result, they may attempt to take out their frustration or anger on the phlebotomist. Regardless of what the patient says or how the patient acts, the phlebotomist must remain polite and professional. Whatever happens or whatever is said to you, do not take it personally. Being polite and as kind as possible is the easiest way to improve an unpleasant situation. However, phlebotomists should be aware of situations that are unsafe for them. For example, if a patient becomes hostile or attempts intimate physical contact, the phlebotomist should leave the room as quickly and calmly as possible.

Checkpoint Questions 7.2

1. Why is it important to maintain a pleasant, professional attitude while working with patients?
2. Describe how you should let inpatients know you are entering their room.

7.3 Healthcare Ethics and Law

As a phlebotomist, you need to know how law and ethics apply to your profession. This knowledge will help you

- function at the highest possible professional level
- provide competent, compassionate healthcare to patients
- avoid legal entanglements

Code of Ethics

Ethics is a moral philosophy that varies by individual, religion, social status, or heritage. A **code of ethics** is a set of written or unwritten rules, procedures, or guidelines that specify values, actions, and choices to help us determine right from wrong. Following a code of ethics is a key part of being a phlebotomist. Acting morally toward others requires putting yourself in their place. If you were a patient requiring blood tests to rule out a disease or other condition, you may not want other people to know, so neither would your patient. As a phlebotomist, you must respect the patient's rights and keep information confidential. This is just part of the phlebotomist's code.

Healthcare and the Law

A **law** is a rule of conduct or action prescribed or formally recognized as binding or enforced by a controlling authority. You may think of laws as rules necessary to keep society functioning. If a law is violated, a civil or criminal case may be brought to trial. In a lawsuit, there is a plaintiff (the person bringing the lawsuit) and a defendant (the person against whom the suit is brought). If the defendant is found liable and convicted, a fine, imprisonment, or revocation (taking away) of her license may be the penalty.

Respondeat superior is Latin for "Let the master answer." This doctrine states that an employer is responsible for the acts of his employees, if such acts are performed within the scope of the employees' duties.

Many lawsuits that are brought against phlebotomists involve civil law, which includes wrongful acts against a person. If a phlebotomist intentionally harms another, the plaintiff may seek remedy in a civil suit. These types of cases may involve

- **assault**—the threat of bodily harm or "reasonable apprehension of bodily harm."
- **battery**—an action that causes bodily harm to another or bodily contact made without permission, such as drawing blood without the patient's consent

Negligence is usually the basis for professional malpractice claims. Negligence means that a professional neglects to perform in the manner expected by the profession. Four elements—known as the four *D*s—must all be present for a **malpractice** case:

- Duty—the professional owes a duty of care to the accuser. (The healthcare provider is expected to care for the patient. For example, a phlebotomist is expected to perform venipunctures.)

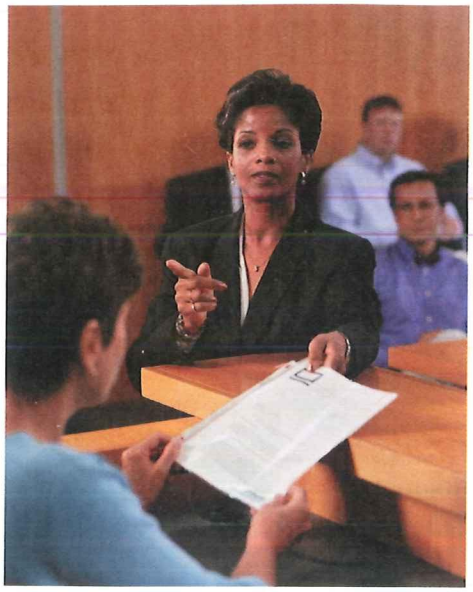


Figure 7-6 Malpractice cases are settled in a court of law.
Guy Cali/Getty Images

- Derelict—the professional breaches the duty of care to the patient. (The healthcare provider acts outside the standards expected of his profession. For example, if the phlebotomist repeatedly explores with the needle [probes] when drawing blood.)
- Direct cause—the breach of the duty of care to the patient is a direct cause of the patient's injury. (The care outside the standards of the profession causes the patient's injury. For example, repeated probing causes nerve damage to the patient.)
- Damages—there is a legally recognizable injury to the patient. (The injury is deemed severe enough to warrant compensation. For example, nerve damage caused by repeated probing is severe enough to cause the patient not to be able to use her computer and her job requires 8 hours a day of computer use.)

In malpractice cases, the burden of proof is on the plaintiff (the patient, or the person who is making the case). (See Figure 7-6.)

Phlebotomists can prevent malpractice cases by following these guidelines:

- *Caring*—as a phlebotomist, caring about your patients is your most important job.
- *Communication*—the more clearly you communicate, the more likely you are to earn your patient's trust.
- *Competence*—know your professional duties well, including your limitations, scope of practice, and standards of care. Participate in job-related continuing education. These parts of competence are discussed in detail in the chapter *Practicing Professional Behavior*.

Patient's Rights and Consent

Patient's Rights

The issue of patient's rights is not new. Patients have the right to refuse care, to be treated with respect, to have all records and information classified as confidential, to be informed about the purpose and expected results of treatments, and to have access to medical care and their medical records.

Consent

Consent is an important legal aspect of phlebotomy. It is the phlebotomist's responsibility to inform the patient of the pending procedure and to ensure they agree. After formally identifying the patient, as described later in this chapter, the phlebotomist must explain to the patient in nonmedical terms, using simple language, what he can expect to happen during the procedure. The phlebotomist must ensure that the patient understands what is about to take place. Most people have had a blood test before, so the explanation "I'm here to draw your blood" should be sufficient.

If the patient does not understand English, the phlebotomist must use hand gestures, a demonstration of a venipuncture, or some other means to get the idea of the venipuncture procedure across to the patient. Most hospitals require a translator be present at the facility or at least a translator phone service be available. Family should not be used to translate except for extreme emergency situations because they may not correctly interpret the information to the patient, and this incorrect information may not be detected by the caregiver. Interpreting medical terminology often requires specialized study, as even someone who is fluent in a foreign language can struggle with topics as technical as medical language.

Patients generally sign a consent form for surgery or treatment which is part of informed consent during the initial admissions process before entering the hospital or before being treated by a physician in the physician office. Consents take a variety of forms, including written agreements, spoken words, implicit or unspoken/implied actions, and appointments for tests. When a patient gives consent in words it is **expressed consent.** When a patient arrives at the laboratory, sits in the chair, and holds out their arm that is **implied consent.** It is always important to provide quality patient education and to make sure the patient understands what is agreed upon.

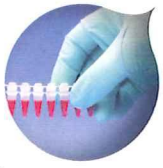
Phlebotomists are also instrumental in collecting specimens for chain of custody, which is the documentation process for specimens of a legal nature, such as evidence. In these cases, it is essential to discuss express consent with the patient. **Informed consent** means that the patient not only has to be informed of the procedure and its process but also must sign a consent form, agreeing to have the procedure done. Other procedures that may require express written consent are drug and alcohol screens, surgical procedures, and HIV testing.

Consent must always be very clear. If a patient just puts out an arm but does not bother to stop watching TV or otherwise acknowledge the phlebotomist, this is considered implied consent. If the patient does not speak English but notices the tray and automatically extends an arm, that, too, is considered implied consent. If conflicting information is present, or if the patient doesn't understand English and seems confused about what you are there for, you *must* be very careful to verify whether the patient truly understands what is about to happen and consents to the phlebotomy procedure. Conflicting consent has resulted in several lawsuits.

Law & Ethics

Patient Discrimination

With few exceptions, phlebotomists are required to obtain blood specimens when ordered by the primary practitioner, regardless of the patient diagnosis. Patients with infectious diseases, such as tuberculosis, hepatitis, and AIDS, have the right to have their blood drawn just as other patients do. It is considered discrimination to refuse to draw blood from these patients and may result in disciplinary actions and/or legal liability. All patients, regardless of condition, should be treated with respect and dignity. Certain exceptions can occur, however, in which a phlebotomist may not be required to draw a specimen, such as when a patient is receiving radiation treatment and the phlebotomist is pregnant or when an irate patient infected with hepatitis or AIDS might compromise the phlebotomist's safety.



Safety & Infection Control

Phlebotomist Safety

As a phlebotomist, it is important to protect yourself against harm from blood and body fluid exposure, as well as legal issues. If you feel as though there are policies and procedures that will place your safety in jeopardy, you must first alert your supervisor. If there is no resolution, take it to the next person in charge until your situation has been resolved. Phlebotomists may also purchase liability insurance through several insurance carriers that provide low-cost coverage to healthcare workers. Be sure to check with your employer to see if it carries liability coverage for employees. If so, there is no need to purchase liability insurance.

If a minor child or patient who is mentally incompetent is to have blood drawn, and the parent or guardian is not present, the written consent for treatment the parent signed on admission is considered adequate. There are three instances in which a patient *cannot* refuse to consent: the patient is a minor under the age of 18 and consent was obtained from the parent or guardian, the patient has a mental impairment (not able to understand), or the patient has been ordered by law to have his or her blood drawn.

Patient Refusal

Sometimes a patient refuses to have his or her blood drawn. When this happens, explain that the physician has ordered the test and the test results are needed to help diagnose or treat his or her medical condition. If a patient still refuses, do not attempt to draw blood; instead, politely leave the room. It is the patient's right to refuse the procedure (except in the situations listed in the previous section), and the phlebotomist should not badger or restrain the patient in order to perform the procedure. Inform the licensed practitioner (nurse or physician) of the patient's refusal and document a detailed account of the patient interaction. Be sure to document in writing—in a note on the laboratory requisition or in a comment field on the computer—that the patient refused the procedure. Make sure to include the name of the licensed practitioner whom you informed about this, along with the date, the time, and your initials. You should also inform the phlebotomy supervisor of the situation.

Patient Confidentiality

The **Health Insurance Portability and Accountability Act (HIPAA)** was established in response to information that was being transferred electronically for medical transactions. In 2003, a federal law was passed that establishes a national standard for electronic healthcare transactions and protects the privacy and **confidentiality** of patient information. Among other provisions, HIPAA states that information about a patient must not be discussed with individuals other than the patient unless the patient has given written or verbal permission for you to do so. A patient's information cannot be shared among healthcare professionals unless it is for the patient's treatment. The following is a list of other HIPAA guidelines that may apply to the care of patients during phlebotomy:

- Close patients' room doors when caring for them or discussing their health.
- Do not talk about patients in public places.
- Turn computer screens that contain patient information so that passersby cannot see the information.
- Log off computers when you are done.
- Do not walk away from patient medical records; close them when leaving.

Violation of the provisions of HIPAA can result in fines and/or termination of employment.

Law & Ethics

Confidentiality

The phlebotomist may be privy to laboratory results. If you disclose results of any laboratory test to anyone other than a healthcare provider, or even access information that you do not need to know to perform your duties, you will have breached patient confidentiality and may be subject to disciplinary action, dismissal, legal action, or a monetary fine.

All information concerning the care of patients is strictly confidential and is not to be discussed. Inpatient settings may require the phlebotomist to travel throughout the facility to collect specimens, from the patient's bedside to other departments, such as the emergency room. Information obtained, no matter how seemingly insignificant, must remain confidential to protect both the patient and the facility. Fines have been set and imposed for any individual who violates the HIPAA standards.

Maintaining confidentiality sometimes involves communicating with the patient's visitors. On occasion, family members can calm the patient prior to procedures, but there are times when visitors interfere with the blood collection process. So if there are too many visitors or if the visitors appear to make the patient anxious, politely request that they leave the room for a few minutes. It is rare that visitors will resent such a request when asked politely.

Checkpoint Questions 7.3

1. How would you obtain informed consent to draw blood from a 6-year-old child?
2. Describe some steps you could take to ensure you are following HIPAA guidelines.

7.4 Patient Identification

Proper patient identification is a top priority for patient safety and must be performed prior to any patient procedure, including phlebotomy. The National Patient Safety Goals established by The Joint Commission recommends the use of at least two patient identifiers (not including the room number) before blood samples are obtained. As discussed in the chapter *Phlebotomy and Healthcare*, The Joint Commission is the organization that sets standards for patient care in healthcare facilities.

To follow the National Patient Safety Goals and prevent an error, the phlebotomist must carefully identify every patient. Upon entering the patient area, the phlebotomist must check the patient identification. In acute care settings, patients have an armband or identification label bearing the patient's first and last names, the hospital number, the patient's date of birth, and the physician's name. Proper identification of the patient is a three-step process (see Learn How 7-1 and Figure 7-7).

If the three-step process is followed, correct patient identification can be established, thereby eliminating errors. The presence of doubt at any point during the three-step check calls for further investigation of the patient's identity. If the patient is unable to state his name, find another person, such as the nurse or a family member (depending on the setting), to state the name for you.

Learn How 7-1

Patient Identification
1. Ask the patient to state and spell his or her full name and state his or her date of birth. Be sure that you do not call the patient by name prior to this because patients with altered mental states may simply repeat the name they hear.
2. Compare the name on the test requisition form/slip and preprinted labels (if provided) to the patient's response.
3. Confirm the patient's identity by checking the medical record number, patient armband, or some other form of government-issued identification, such as a driver's license. (See Figure 7-8.)

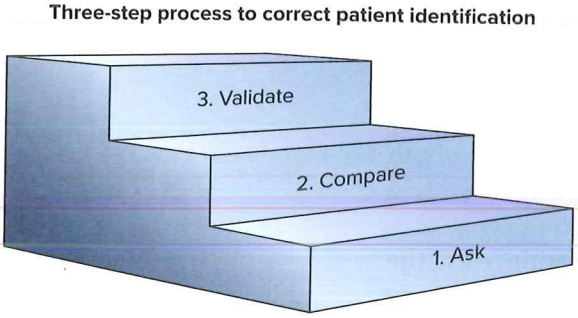


Figure 7-7 Follow a three-step process for correct patient identification.

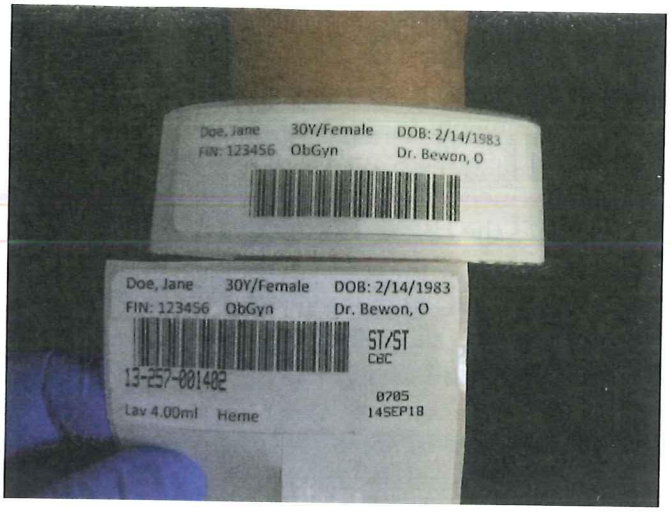


Figure 7-8 Confirm patient identification by comparing phlebotomy requisition label with inpatient armband.
Lillian Mundt

In a hospital setting, all patients must wear an identification bracelet. Most hospital policies require that a patient wear an identification bracelet in order for any procedure to be done, including phlebotomy. All laboratory specimens require a licensed healthcare provider's order; therefore, requisition labels will be available for the specimens you are to collect. Remember that all specimens require proper collection, handling, labeling, and transportation to the laboratory for testing.

Accurate patient identification and proper preparation are mandatory. It makes no difference how sophisticated or expensive the laboratory equipment is on which the specimen is tested. The results will be wrong if collected from the wrong patient. If this occurs, the effects on healthcare delivery can be disastrous. Say, for instance, that a blood specimen was collected for a cross-match because Mr. W. Buller is having surgery. Instead, the cross-match specimen is collected from a Mr. B. Buller. After Mr. W. Buller's surgery, he is given the unit of blood the doctor had requested. However, it was an incorrect cross-match, resulting in the wrong blood being administered. Mr. W. Buller can suffer serious consequences ranging from minor transfusion reactions to death as a result of this error. Because the result of identification errors can be serious or deadly, phlebotomists have been fired due to lack of proper patient identification.

Another potentially serious consequence of inaccurate patient identification occurs when specimens are needed for diagnostic testing or monitoring of treatments and medication levels. If the wrong patient's blood is drawn, the physician will receive the wrong results. The physician then adjusts the patient's treatment or medication according to incorrect information, and the patient can become ill or even die. Although these are extreme cases, such unfortunate patient identification errors have occurred and can still happen. So again, the most important step in a venipuncture procedure is proper patient identification.

Always ask the patient to state his name and date of birth. Never ask, "Are you Mr. (Name)?" A person who is on medication or is a heavy sleeper may answer yes to any question you ask. Allow the patient to answer fully, not just say yes or no. Ask for the information you have on the requisition form, such as the patient's date of birth. You can also ask an outpatient for his address, if it is supplied on the form. Remember, you must verify at least two patient identifiers before proceeding. Although not a replacement for the two identifiers, you can also double-check the two identifiers you are using by matching

information provided to you visually. For example, does the patient match the age and sex given on the requisition form?

Phlebotomists may encounter a situation where the patient has an alias. One name may be recorded in the electronic medical record (EMR) while another is on the wristband or computer-generated label. For instance, some people use their middle name instead of their first name, which should be used for legal records. Another example may be someone who uses a maiden last name, but also uses their married last name. The patient's EMR should display both aliases. If there is any confusion over patient identification ask the patient or patient's nurse or have the patient provide another legal form of identification to confirm their identity.

Communicate & Connect

Confirming Patient Identification

At least two identifiers must be used when identifying patients prior to specimen collection. Patient identification should not be performed hastily or cut short by using only one identifier. It is not uncommon for the phlebotomist to find a discrepancy or difference in the spelling of the patient's name on the lab requisition form when comparing it to the patient's wrist (identification) band or having the patient spell his or her name. When this occurs, the phlebotomist must find out which spelling of the patient's name is correct before collecting specimens. Make sure the correct spelling is on the requisition form, the ID band, and the specimen(s), once labeled. Most facilities have procedures in place for documenting discrepancies and taking corrective action. Be sure to follow policies and procedures at your facility.

Identification of Inpatients

As mentioned, you must check the identification (ID) band on an inpatient's arm. This includes identification of patients in the emergency room. If the patient does not yet have an identification band, you should wait until the patient is properly banded before proceeding with blood collection unless instructed otherwise by your supervisor. Does the identification number on the armband match the one on the requisition form? Does the information on the ID band exactly match the information on the requisition? You must use at least two identifiers, such as name, birth date, and/or medical record number. Both identifiers must match the requisition. *Even if there is only one number or letter difference, you cannot proceed with the venipuncture.*

Never rely on the information on any item, such as a card, that is taped to the door, wall, or end of the bed. Patients are often transferred from room to room or out of the hospital without this information being changed. Only the information on the patient's ID band, while on the patient's wrist, should be compared. Even wristbands may be exchanged or switched. It is best to check the wristband *and* to ask the patient questions. If there is a discrepancy or contradiction, ask for assistance from the patient's nurse.

Some facilities use a bar code system of identification. The bar codes on both the requisition and the patient ID band are scanned and must match before you can proceed (see Figure 7-9). However, you must still verify the name and date of birth verbally if the

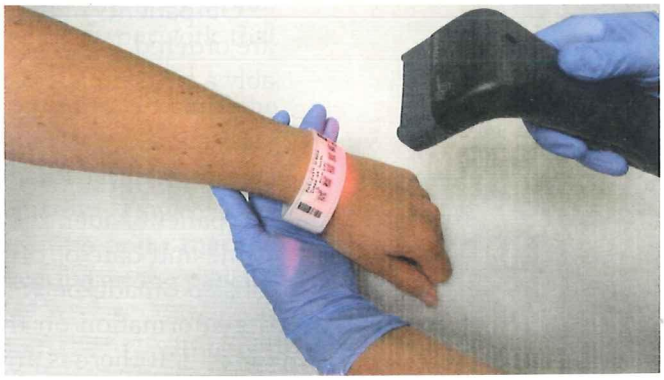


Figure 7-9 Check the identification bracelet of an inpatient. In some cases, scanners are used for proper identification.
Lillian Mundt

patient is able to respond. Any discrepancies in patient identification must be resolved before you can proceed with specimen collection.

In some circumstances, the ID band is not on the patient's wrist. If this is the case, check to see if the ID band is on the patient's ankle instead. An ID band may be placed on the ankle because of burns, amputation, or swelling of the arm. If the patient does not have an ID bracelet attached to his arm or ankle, the nurse responsible for the patient must properly band the patient *before* any sample is collected.

If the patient is unable to speak because he is sedated, in a coma, or on a ventilator, a healthcare professional, relative, or friend will need to provide verbal verification of the patient's identity including the first and last name with spelling and date of birth. The phlebotomist should compare verbal information with the patient's armband and the requisition.

Sometimes you will be expected to collect a specimen from an unconscious or nonresponsive patient. You must still identify yourself and inform the patient of the procedure you are about to perform. Unconscious patients may still be able to hear what is being said to them even though they cannot respond. Also, an unconscious patient may be able to feel pain, so you should be prepared for the patient to move once you have inserted the needle. You may need to have someone assist you in holding the arm steady. In addition, you must apply pressure until the site has stopped bleeding after the venipuncture for these patients because the patient is not able to apply adequate pressure.

If the patient is not in the assigned room, proceed to the nurses' station to find out where the patient is and when the patient is expected back. This is especially important if the specimen to be collected is a STAT (immediate) or timed specimen. Make every attempt to locate the patient because sometimes the patient is only walking in the hallway or undergoing a procedure in another part of the hospital. If you cannot locate the patient or the patient has not returned within a reasonable length of time, inform the appropriate healthcare provider at the nurses' station that the specimen was not collected. On the request slip, document the time and the name of the person you spoke with at the nurses' station. Ask that the laboratory be informed when the patient returns and be sure to tell the laboratory supervisor that the patient specimen was not collected, in case the laboratory is called for results.

Identification of Outpatients

An outpatient normally does not have an armband or identification band. Outpatients arrive in the laboratory area with a physician order form or prescription form—or an electronic order is sent to your lab—listing the requested laboratory tests.

Outpatients must be correctly identified *before* they are registered and tests are ordered. This is done by asking for some sort of identification card (preferably a government issued photo identification) and requesting that the patient state and spell their full name and in some cases their date of birth. After the receptionist has verified the patient's identification, registered the patient, and entered the test request into the computer, the phlebotomist must verify the patient's identification. The patient must be asked to state his or her full name and date of birth. Before any specimen is collected, a three-way match must be made between the written or electronic order from the physician, the information on the labels, and the patient's statement of name and date of birth. If there is any doubt about the patient's identity, additional information that may help to establish correct identity includes the physician's name, the patient's ID number (if it appears on the laboratory requisition form), or the patient's home address or telephone number. This does not have to be a

prolonged identification process; usually, two or three verification items are sufficient to ensure proper identification.

Identification of Children

Life Span Considerations

If the patient is an infant or a child under 18 years of age, the parent or legal guardian with the child must state the child's full name and date of birth. In addition, the parent or legal guardian must provide valid photo identification with the physician's written order (if not already ordered electronically).

Special Considerations for Psychiatric Patients

Communicate & Connect

The challenges presented by patients with a mental illness may test both your technical skills and your interpersonal skills. These patients may have a hard time remaining calm and still during the procedure. They can be combative, scared, or anxious due to fear of the unknown. Or they may simply not understand the procedure that is taking place because of their frame of mind or medication. Patients with a mental illness can have a difficult time grasping an idea or a concept, thus making your job as a phlebotomist more difficult. For example, patients may intentionally provide incorrect information. Evaluate the patient carefully for any signs that the process of blood collection might be difficult. If you have a concern, ask another phlebotomist or staff member to assist you when obtaining specimens from patients who have a mental illness.

Checkpoint Questions 7.4

1. A phlebotomist enters a patient's hospital room and says, "Mr. Wilson, I am from the lab and I am here to draw some blood." What error did the phlebotomist make and what should she have said?
2. How should you ensure proper identification of a child under 18?

7.5 Specimen Identification

Proper specimen identification goes hand in hand with proper patient identification. Specimen identification must follow facility policies and procedures to ensure patient safety and quality patient care. Occasionally, unlabeled specimens are sent to the laboratory. There is no way of positively knowing whom the specimen is from, even if this information is included on paperwork that accompanies the specimen.

Unlabeled specimens are rejected according to laboratory policy and must be re-collected. This causes delays in testing and reporting of results. Mislabeled specimens are especially dangerous. Laboratory personnel may have no idea that a specimen is labeled with the wrong patient's information. Tragic consequences can result from mislabeling a patient specimen in the event that the results from that specimen are used to diagnose and/or treat the wrong patient.

Labeling the Specimen

All specimens must be labeled properly before leaving the patient's room or the blood collection area. Label all specimens immediately, using computer-generated labels or writing the necessary information directly on the tubes

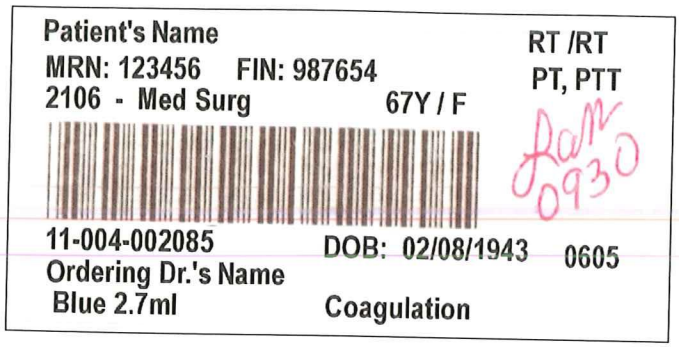


Figure 7-10 Specimen labels include, at a minimum, the patient's name and date of birth, a unique identification number, the time and date of collection, and the initials or identification code of the person performing the specimen collection.
Lillian Mundt

with a permanent marker (see Figure 7-10). In an effort to standardize labeling procedures and reduce labeling errors, the Clinical Laboratory Standards Institute (CLSI) developed standards for specimen labeling. Five elements must appear on each patient specimen label:

- Patient's full name
- Unique patient identifier (medical record number or other number used by the facility)
- Specimen collection time and date (printed or recorded on the label after collection)
- Collector's identification (name, initials, or operator identification, recorded after collection)

In addition, the label may include other information required by the laboratory, such as the following:

- Patient location
- Patient's date of birth
- Ordering physician
- Computer accession number (unique number in a sequence)
- Specimen requirements (test ordered, tube type, and special handling)
- Other comments or special instructions

Make sure you write the time of collection on the computer-generated labels and initial them. Your initials or code number must be present, in case there is a question about the specimen, so that laboratory personnel will know whom to ask. The actual time of collection is critical for fasting specimens and the monitoring of therapeutic drug levels. Some bar code readers are equipped with a label printer that will print the time of draw on the label; they may be programmable to include phlebotomist information as well.

Always label the blood tubes *after* drawing the blood. This is done for several reasons. A tube may have lost its vacuum, in which case the label is wasted because it is difficult to transfer most computer labels. You may not be able to obtain a sample and an unused tube then has the wrong patient information name on the label. This tube might accidentally be used to draw blood from another patient. At an inpatient facility, sometimes blood tests are canceled or the patient has been discharged by the time the phlebotomist arrives at the patient's room. Having tubes prelabeled creates a potential for mistakes and wasted supplies.

Another reason to avoid prelabeling tubes is that you may be interrupted by a STAT request while away from the laboratory, drawing blood. This request requires that you respond immediately and postpone drawing another patient's blood until you have collected the STAT blood specimen. The only safe way to collect specimens is to label them at the time of collection, after obtaining the blood but before leaving the patient.

Mislabeled specimens can lead to serious patient complications. Imagine that a potassium level is drawn on a patient who has a very low level, yet the specimen bears the label of another patient. The patient whose blood has been drawn may then receive unnecessary potassium supplements, whereas the other patient may not get the needed potassium replacement therapy. Both patients' medical care would be greatly compromised, and the mix-up may even result in death. Thus, proper labeling is a matter of life or death.

Labels must be placed on tubes as shown in Figure 7-11A. Information on the left end of the label should be placed near the cap end of the tube. The label should be straight, smooth, and not overlapping the cap. The label should be placed over the tube so the contents can easily be viewed. Improper label placement, as shown in Figure 7-11B–D, may cause problems with performing laboratory tests. A label over the cap may cause problems with opening the tube or loss of information when the cap is removed; a label hanging over the bottom will cause tubes to get stuck in instrumentation, such as blood cell counters and chemistry analyzers, or loss of information may occur when this part of the label is cut off so as not to jam in the instrument. Crooked bar codes do not scan properly by instrumentation. Remember, improperly labeled tubes cause delays and errors in testing and reporting of results.

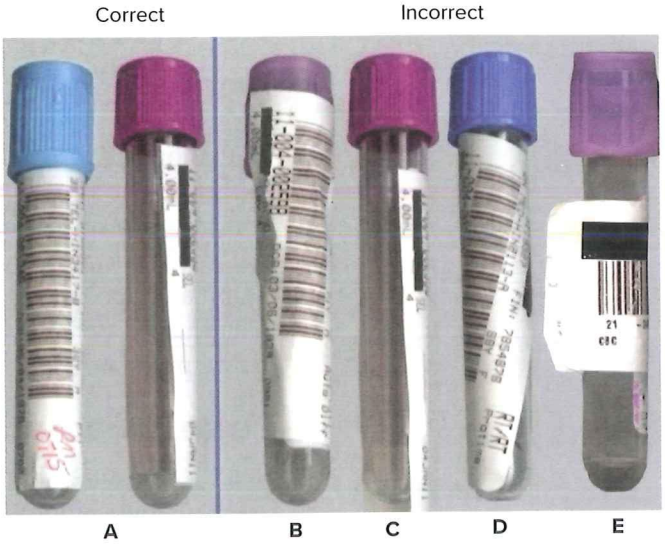


Figure 7-11 Specimen collection tubes: (A) properly labeled, (B) label over the cap, (C) label hanging off the bottom, (D) label not straight on the tube, and (E) label placed sideways on tube.
Lillian Mundt

Since all blood specimen tubes must be properly labeled at the patient's bedside you should never label specimens for which you should not assume responsibility. For example, if you find a specimen tube without a label, bring it to the attention of other team members. Do not label specimens that you did not collect. If you label a specimen as requested by a team member, you become accountable for the accuracy of that specimen. Unless you saw your team member obtain the specimen, you cannot be sure that the blood specimen belongs to that patient. Just imagine the potential implications of placing the wrong patient label on a specimen: a patient with a potentially abnormal test result may not receive needed treatment and a patient not needing that treatment may receive it. Both of these situations can compromise patient safety and lead to disciplinary actions.

Specimen Identification

Think It Through

Imagine the following scenario involving specimen identification. Blood for a platelet count was collected from two patients occupying the same room. The platelet count on the patient who had entered the hospital to have his low platelet count monitored was now normal and he was sent home. The blood draw for the other patient was his first since being admitted, and his platelet count was critically low. This patient is scheduled for consult with a hematologist about possible bone marrow analysis procedures. Later in the week, the patient who was discharged returns because of a bleeding problem. Upon investigation, it was discovered that the platelet count samples for these two patients had been switched. How could this have occurred? How could this mistake have been avoided? What could have been the outcome for these patients? What may have happened to the phlebotomist because of this mistake?

Checkpoint Questions 7.5

1. When should a specimen tube be labeled, and why?
2. What are the five elements that must appear on each patient specimen label?

7.6 Factors Affecting Specimen Quality and Test Results

Phlebotomists have an essential role in ensuring the quality of the specimens collected. Laboratory test results depend not only on proper specimen collection but also on patient status. Various factors affect laboratory results. The factors that occur prior to performing laboratory tests, such as patient identification and specimen labeling, are called pre-examination variables. Some pre-examination variables depend on the patient, whereas others are controllable by the phlebotomist.

Patient Factors

Healthcare professionals should have a basic understanding of patient factors that can affect laboratory results. The phlebotomist must also understand why patient preparation before collection and the timing of the collection can be critical to a patient's care and well-being. Phlebotomists often have little to no control over the effects of patient status on laboratory tests. Table 7-1 lists some patient variables that affect laboratory results. Pre-examination variables due to the order of draw, complications of specimen collection, and specimen processing, over which phlebotomists may have control, are discussed in more detail in chapters *Blood Collection Equipment, Venipuncture, Dermal (Capillary) Puncture,* and *Blood Specimen Handling*.

Normal ranges, also called *reference ranges,* for some laboratory **analytes** (chemicals and other substances being measured) vary with patients' age and gender. All laboratories have established reference ranges for their patient population. These ranges are reported with patient test results. Examples of laboratory results that vary by age and/or gender are RBC count, hemoglobin, white blood cell differential, and nutrient levels.

Environmental Factors

Altitude

Normal, or reference, ranges for laboratory analytes are typically determined on populations living at sea level. Laboratories at higher elevations must determine normal ranges for their patient populations residing at these higher elevations (see Figure 7-12). Analytes that show a significant increase at higher elevations include RBC count and hemoglobin. This is because there is less oxygen at higher elevations, so the body needs more RBCs and hemoglobin to provide greater oxygen-carrying capacity. Certain enzymes involved in oxygen exchange are also increased at higher altitudes. For example, urates (byproduct of protein degradation) may increase due to the increased turnover of red blood cells.

People who visit areas of higher elevation for a length of time may show a transient, or temporary, rise in their red blood cells, hemoglobin, and related test results. If they are tested immediately after returning to lower elevations, their results may be interpreted as abnormal. Understanding the effects of such travels on laboratory values is important when discrepancies with patients' previous results arise.

Geographic Location

The environment in which people live can affect the composition of their blood. For example, people residing in areas of high automobile traffic may have higher levels of lead and carboxyhemoglobin (carbon monoxide attaching

TABLE 7-1 Some Patient Variables That Affect Laboratory Tests

Variable	Tests Affected
Nonfasting	Glucose Lipid profile • Total cholesterol • HDL • LDL • VLDL • Triglycerides
Stress	Adrenal hormones Fatty acids Lactate White blood cells
Posture	Albumin Bilirubin Calcium Enzymes Lipids Total protein Red blood cells White blood cells
Exercise	Aldolase Creatinine Fatty acids Lactate Sex hormones AST CK LD White blood cells
Diurnal variations	Cortisol Serum iron White blood cells
Alcohol	Lactate Triglycerides Uric acid GGT HDL
Tobacco	Catecholamines Cortisol Hemoglobin White blood cells

to hemoglobin) in their blood (see Figure 7-13). Trace elements, such as lead and zinc, may be found at higher concentrations in those living near smelting plants, and people living in areas where the water is "hard" may have higher lipid and magnesium levels.

Temperature

Changes in environmental temperature affect the distribution of water between the tissues and the blood. If more water enters the blood vessels,

Figure 7-12 People living at high altitude may normally have blood results that are far different from people living at sea level.
©GOODSHOOT/Alamy

Figure 7-13 In areas of high automobile traffic, a patient may have higher levels of lead and carboxyhemoglobin in his or her blood.
©Stockbyte/Getty Images

Figure 7-14 Exposure to extreme temperatures can cause a shift in fluid balance that may affect blood test results.
PNC/Brand X Pictures/PunchStock/Getty Images

some analytes may decrease; conversely, as water leaves the blood vessels, some analytes may increase. Plasma protein levels can drop slightly during acute or severe exposure to heat. Electrolytes can be out of balance during profuse sweating (see Figure 7-14).

Hydration

Water is essential to maintaining a balance among the cells and chemicals in the bloodstream and tissue fluids (see Figure 7-15). Disruptions in this balance may lead to health problems, and they create difficulties in interpreting laboratory results. When patients are dehydrated (decreased plasma water), the effective concentration or percentage of many substances in the blood increases. This phenomenon is called **hemoconcentration.** Dehydration leading to hemoconcentration may occur due to persistent vomiting, diarrhea, diabetic acidosis, or inadequate fluid intake.

The opposite imbalance in hydration is **hemodilution.** Hemodilution is an increase in plasma water, which may result in decreased concentrations of substances in the blood. The physical levels (presence/amounts) are not actually affected in this case, but their concentration is diluted by the excess fluid. Hemodilution can occur in water intoxication, salt retention syndromes, and infusion of massive amounts of intravenous fluids. Imagine a cup half full of water that has a drop of food coloring added. Now imagine the change in the intensity of the color when more water is added to the cup, lowering the concentration of the dye. Similarly, more water in blood will result in lower concentrations of cells and chemicals in the blood. Blood cell counts and chemistry tests are most commonly affected by imbalances in hydration.

Figure 7-15 A person's state of hydration can affect blood test results by causing hemoconcentration or hemodilution.
JGI/Blend Images

Posture, Exercise, and Stress

Blood levels of some analytes change when a patient's posture changes or as a result of changes in activity from **ambulatory** (walking about) to **sedentary** (no physical activity). The lack of activity causes the body's tissues to allow more water to enter the circulation, which increases the plasma volume. Some analytes, such as total calcium, may be diluted more than normal and appear decreased in bedridden patients. Strenuous exercise (see Figure 7-16) can cause an elevated white blood cell count, alterations in the coagulation system, and fluctuations in various enzyme and other chemical levels. Stress, such as anxiety, fear, or nervousness, can have effects similar to those caused by exercise.

Timing of Specimen Collection

Many laboratory tests can be drawn at any time throughout the day because eating and exercise have little effect on the results. However, certain laboratory tests require special patient preparation and timing. The phlebotomist must understand why patient preparation before the collection and timing of the collection can be critical to a patient's care and well-being.

Patient Basal State A patient who is at rest and has been **fasting** (nothing to eat or drink, except plain water) for at least 12 hours is said to be in **basal state.** A patient who arises in the morning and immediately exercises is not in a basal state, even if he is fasting, because the exercise alters the body's metabolic processes. Specimens collected during basal state, early in the morning, provide the most accurate assessment of blood constituents (substances) such as electrolytes, glucose, lipids, and proteins.

Diurnal Variation **Diurnal variation,** also called diurnal rhythm, is the variation in an analyte at different times throughout the day. Certain hormones, such as testosterone, decrease during the afternoon, whereas others, such as thyroid-stimulating hormone, increase in the evening. The levels of some types of white blood cells may rise during the day. Some analytes may show a drop in blood levels and a rise in urine levels at the same time. Thus, specimens for hormones and other tests must often be drawn at the time of day corresponding to the diurnal variation of a particular analyte.

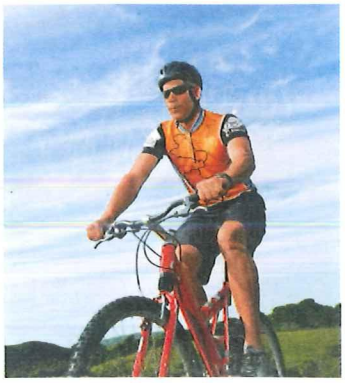


Figure 7-16 Strenuous exercise can cause imbalances in many cellular and chemical components of blood.
©Chris Timken/Blend Images LLC

Life Span Considerations

Crying Infants

Similar to strenuous exercise, excessive crying by an infant can cause his leukocyte count to be elevated. It takes 60 minutes for the leukocyte count to return to normal. Thus, if an infant has just had a procedure (e.g., circumcision or vaccination) that has resulted in excessive crying (see Figure 7-17), you should wait 60 minutes before attempting blood collection. If you are asked to collect the specimen anyway, include a note on the requisition or in the comment section on computerized documentation that the infant was crying excessively.

Timing for Drug Levels Frequently, laboratory requisitions note the time a blood sample should be drawn. As mentioned previously, some specimens need to be collected when the patient is in basal state; others must be collected **postprandial** (after eating). Another reason for specimens to be drawn at a specified time is **therapeutic drug monitoring (TDM).** TDM is monitoring the amount of a therapeutic drug in the blood. The healthcare provider needs to know if the dose of a medication is at the appropriate level to ensure that it is effective. A drug peak level may be requested. A **peak level** is a specimen collected when the serum drug level is at its highest, shortly after a medication is given. The laboratory results for the peak level determine the amount of medicine the physician orders for the patient's next dose. For therapeutic drug monitoring, both peak and **trough levels** may need to be collected. Trough levels are collected when the drug level in the blood is at its lowest, usually immediately before the next scheduled dose. Figure 7-18 displays a graph that helps determine when specimens for peak and trough levels should be collected.

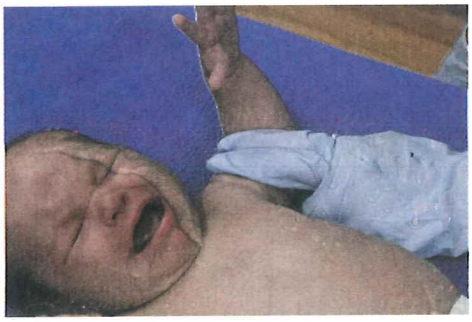


Figure 7-17 Infants who have been violently crying will have altered blood test results. It is best to return to collect the specimen after the child has been calm for at least 1 hour. If a specimen must be collected while the child is crying, note it on the requisition or enter this information into the laboratory information system.
Rick Brady/McGraw-Hill Education

Think It Through

Timing Not Followed

Phlebotomists should become familiar with the tests that are most likely to require specific collection times. These tests include measuring the level of antibiotics, such as gentamicin. Consider the consequences of blood for therapeutic drug monitoring (TDM) being collected several hours before or after the requested time. What is the phlebotomist's responsibility in TDM collections?

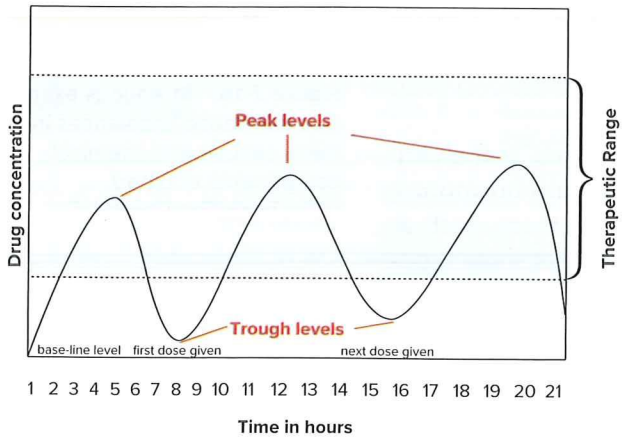


Figure 7-18 Blood for therapeutic drug monitoring is collected when concentrations are at their highest levels for the dose (peak) and lowest levels (trough), just before the next dose.

Dietary Restrictions

After properly identifying the patient and obtaining patient consent for the phlebotomy procedure, you must verify any special dietary restrictions or instructions. These restrictions include fasting and the avoidance of certain foods. Laboratory tests can be affected by what a patient eats or doesn't eat, or even by whether the patient has smoked within a designated time. To verify that a patient has followed the instructions given when the test was ordered, simply ask, "When was the last time you had anything to eat, drink, or smoke?"

The most common dietary restriction that affects specimen collection is fasting. This restriction requires the specimen to be drawn after the patient has not ingested foods or liquids for a specified period of time. Routinely, the fast is for 12 hours. In some instances, the licensed practitioner may request a fast of 4, 8, 10, or 16 hours.

Some laboratory tests require special diet instructions. The patient may be instructed to eat or not to eat certain foods for a specified number of days or hours before the specimen is taken. A common test request is for a 2-hour postprandial glucose test. This laboratory specimen must be drawn 2 hours after the patient has started eating a meal, usually breakfast. If a restriction or special diet is required and the patient has followed this requirement, make a notation on the requisition slip. Also note the last time the patient had anything to eat, drink, or smoke, and note whether special dietary instructions were followed.

Communicate & Connect

Fasting

Patients should be informed of their exact requirements for fasting. Fasting means having nothing to eat or drink (except for minimal amounts of water) for 8 to 12, or even 16, hours before blood is to be collected. Drinking water may be allowed and in some cases even encouraged to prevent dehydration and to prevent inaccurate laboratory results. Written instructions with detailed explanations should be provided to all patients.

Sometimes patients forget or are not informed of the dietary restrictions necessary before blood is drawn (see Figure 7-19). Ensure that the patient has not eaten if a fasting specimen is needed. In these circumstances, if the patient has not fasted the required length of time, you will need to ask the licensed practitioner if a nonfasting specimen will be adequate. In some instances, this will be allowed. The normal values of some laboratory tests, such as cell counts, are not

markedly different if the patient was nonfasting before the specimen was drawn. However, for some tests—especially glucose and lipid profiles—the specimen has to be fasting. If the licensed practitioner approves collecting the nonfasting specimen, note "nonfasting" on both the tube and the laboratory requisition. Additionally, make a notation on the laboratory requisition of the name of the person who approved taking the specimen from a nonfasting patient. It is good practice to notify the laboratory section performing the test that the licensed practitioner approved the nonfasting sample. Some laboratories will not report results if proper patient procedures (such as fasting) were not followed unless approval is noted.

Figure 7-19 Ensure that the patient has not eaten if he is supposed to have a fasting specimen collected.
Lillian Mundt

If blood is drawn shortly after a meal, the serum may appear cloudy, or **lipemic.** Lipemia is due to the large amount of fatty compounds in blood after a meal and it interferes with many laboratory tests. Severely lipemic specimens have an appearance similar to milk instead of the normal serum appearance of clear yellow fluid. See Figure 7-20.

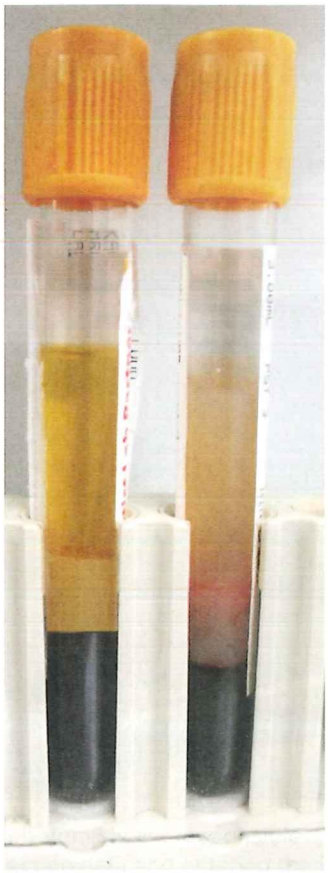


Figure 7-20 The lipemic serum sample on the right is very milky compared with the normal (clear) serum on the left.
Lillian Mundt

Medications as Interfering Substances

Interfering substances are substances that can alter laboratory test results. Substances the phlebotomist has no control over include medications or other drugs the patient is taking (see Figure 7-21). Some medications contribute an abnormal color to blood and/or body fluids, which can interfere with test procedures. For example, some antibiotics (such as erythromycin) and vitamins (such as B_{12}) add orange and yellow coloring (respectively) to blood and urine. These abnormal colors may interfere with tests that require the detection of a color change during testing. Medications can also have an effect on various body systems and may alter the level of chemicals, such as enzymes, that they produce. For example, statins (drugs used to lower cholesterol) may affect liver function and thereby cause an elevation in liver enzymes in the blood. Interfering substances that are under the control of the phlebotomist are those contained in collection tubes (additives) and are discussed in the chapter *Blood Collection Equipment*.

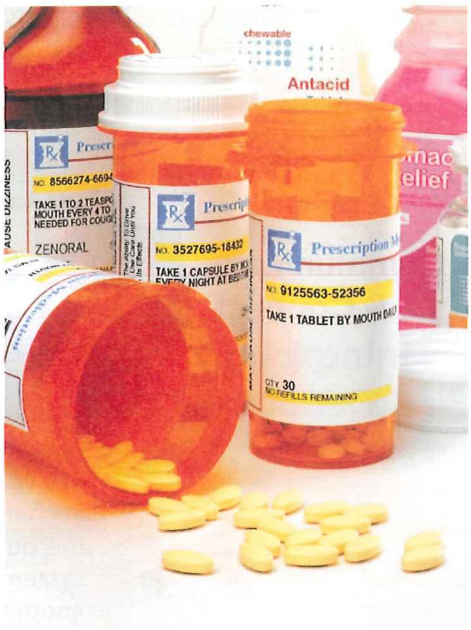


Figure 7-21 Some medications can have an effect on laboratory test results.
Don Farrall/Getty Images

Specimen Transporting and Processing

Laboratory test results can be greatly affected by the way specimens are handled. Thus, the phlebotomist's role is crucial, as she is responsible for ensuring that specimens are handled properly. Specimens must be transported to the laboratory in a timely manner and under test-specific conditions.

Some laboratory tests, especially STAT tests, must be performed within 1 hour of collection. Other laboratory tests must be centrifuged, or separated, within a specified amount of time. The phlebotomist must be aware of the tests that require special handling and apply facility policies concerning the specimens for these tests. Special handling applies to specimens that are to be kept warm or

Checkpoint Questions 7.6

1. Name at least five factors that can interfere with laboratory test results.
2. You enter the room of a crying infant to draw his or her blood. What should you do?

cold, protected from light, centrifuged, or even separated. Specimen processing and transport is covered in further detail in the chapter *Blood Specimen Handling*.

7.7 Documenting Specimen Collection

Electronic Health Records

Because research shows that health information technology helps save lives and lower healthcare costs, the Health Information Technology for Economic and Clinical Health (HITECH) Act was passed in 2009. This bill encourages the use of electronic health records (EHRs) and hopes to cause 90% of doctors and 70% of hospitals to use comprehensive EHRs by the end of the decade. The act helps establish standards for EHRs that will allow nationwide exchange of patient health information. Given this, phlebotomists must be knowledgeable and able to work with electronic health records as part of their day-to-day responsibilities.

An electronic health record is an electronically stored record of patient health information. This information is generated over one or multiple encounters and includes information about patient demographics, progress notes, problems, medications, vital signs, past medical history, immunizations, laboratory data, and radiology reports. The purpose of EHRs is to provide secure, real-time access to patient-centered information, thereby reducing delays in planning, treatment, reporting, quality management, and billing. In the hospital setting, laboratory information found in the EHR includes not only laboratory test results but also collection dates and times, as well as who collected the specimen, who received the specimen in the lab, and who performed or verified the laboratory test results. All comments that were entered during collection verification also appear in this record.

Communicate & Connect

EHR versus EMR?

Although some people use the terms *EHR* (*electronic health record*) and *EMR* (*electronic medical records*) interchangeably, they are different. EMR came first and was only for medical records used by doctors for diagnosis and treatment. EHRs are health records that cover more information, encompassing the total health of the patient. EMRs and EHRs both track data over time; easily identify which patients are due for preventive screenings or checkups, such as blood pressure readings or vaccinations; and help monitor and improve the quality of care within the practice. The difference lies in the ability of EHR systems to travel from facility to facility and from one healthcare provider to another in a secure way. EHRs are used by laboratories and other specialists and allow all members of the healthcare team to access the latest patient information, providing for coordinated patient-centered care.

Specimen Tracking

The phlebotomist's responsibility for documentation includes recording his identification on requisitions and specimen labels and entering collection information and comments into the laboratory log book or into the patient's EHR using the laboratory information system (LIS). See Figure 7-22. Bar code systems with an LIS interface can be used to download time of draw and phlebotomist information from the bar code reader. The entry of these data allows for specimen tracking. Having collection information is helpful when specimen quality concerns arise or when the laboratory staff receives inquiries as to the status of laboratory test collections and anticipated completion times.

In many hospitals, the LIS communicates with the hospital information system (HIS), providing nursing and other staff direct access to this information in the patient's EHR. The LIS may also connect to laboratory analyzers, which expedites the entry of test data and reduces transcription errors. Laboratories may choose to provide remote locations, such as physician offices, with access to the LIS. The interconnectedness of computer systems often means that all patient data, orders, results, and charges may be viewed by anyone connected to the system.

In order to help safeguard the patient's privacy and personal information, phlebotomists must be aware of their responsibility to appropriately access only the information needed to perform their specific job-related duties.

Figure 7-22 Phlebotomists are responsible for recording collection data and entering them into the laboratory information system.
Comstock Images/Getty Images

Think It Through

Exact Time and Identification

It is important to record exact collection times and the collector's identification on the specimen label so that correct information can be entered into the LIS. For example: if multiple specimens need to be collected at different times throughout the day (often needed to monitor treatments), information for each specimen must be accurate in order for primary care givers to make the proper adjustments to treatments.

Checkpoint Questions 7.7

1. Briefly describe the phlebotomist's responsibilities regarding documentation of laboratory specimens.
2. Why are electronic health records useful?

Chapter Summary

Learning Outcome	Key Concepts/Examples	Related NAACLS Competency
7.1 Identify the parts and functions of a laboratory requisition.	Laboratory requisitions must include doctor's name; patient's name, age, date of birth, and identification number; tests to be performed; and date and time for specimen collection.	7.1, 7.2
7.2 Identify the professional communication techniques of the phlebotomist.	Communicating with patients in a professional manner helps instill patient confidence in the phlebotomist.	7.3
7.3 Comply with ethical and legal standards for professional communication.	Following a code of ethics during patient interactions helps prevent accusations of malpractice. Patients must give informed consent to and have the right to refuse any procedures.	9.5, 9.6, 9.9
7.4 Carry out proper patient identification.	Patients must be identified using a minimum of two unique patient identifiers.	4.2
7.5 Define the legal/ethical importance of specimen identification.	Specimen labels must include the patient's name and unique patient identifier (medical record number); the actual specimen collection time and date; and the collector's identification. Improperly labeled specimens can cause errors in treatment, which in turn can result in malpractice.	4.2
7.6 Recognize patient factors that may affect specimen quality and test results.	Phlebotomists must document patient situations that can compromise the quality of the specimen. Patient factors that may affect laboratory results include deviation from basal state, age and gender, dietary restrictions, hydration, activity, and health status. Proper specimen handling includes appropriate collection and transport for each type of specimen collected and timely delivery to laboratory sections.	4.1, 4.3, 4.4, 4.5, 4.6
7.7 Explain the phlebotomist's role in maintaining accurate and secure blood collection documentation.	Proper documentation ensures that tests are performed on the correct patient's specimen and allows for test status tracking; it often requires the use of hospital and/or laboratory computer systems. Patient information is stored in hospital and laboratory computers as part of the patient's electronic health record (EHR). Phlebotomists have access to patient information and must maintain utmost confidentiality.	9.11

Chapter Review

A: Labeling

Identify each lettered item A to M on the test requisition label and write in the lines 1 to 14.

1. [LO 7.1] _____

2. [LO 7.1] _____

3. [LO 7.1] _____

4. [LO 7.1] _____

5. [LO 7.1] _____

6. [LO 7.1] _____

7. [LO 7.1] _____

8. [LO 7.1] _____

9. [LO 7.1] _____

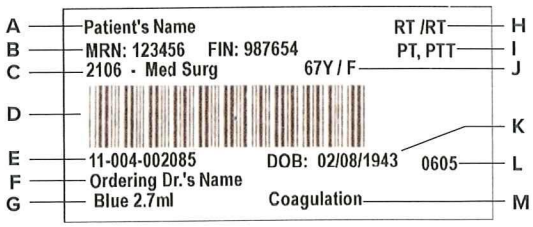
10. [LO 7.1] _____

11. [LO 7.1] _____

12. [LO 7.1] _____

13. [LO 7.1] _____

14. [LO 7.1] _____



Lillian Mundt

B: Matching

Match each term or abbreviation with its definition.

15. [LO 7.1] accession number

16. [LO 7.6] analyte

17. [LO 7.6] basal state

18. [LO 7.6] diurnal variation

19. [LO 7.6] fasting

20. [LO 7.6] HIS

21. [LO 7.6] lipemic

22. [LO 7.6] LIS

23. [LO 7.6] peak

24. [LO 7.6] postprandial

25. [LO 7.6] trough

a. highest blood concentration of a drug level
b. after a meal
c. increased fats in the blood
d. lowest blood concentration of a drug level
e. nothing to eat or drink except water for a specified amount of time
f. 12-hour period without intake of food and exercise
g. normal daily changes in lab values
h. substance undergoing analysis
i. reflects the sequence in which the laboratory receives an order
j. facility-wide computer system
k. computer system for the laboratory

C: Fill in the Blank

Write in the word(s) to complete the statement.

26. [LO 7.2] Displaying a professional manner that includes behavior, appearance, courtesy, and respect toward patients is called _____.

27. [LO 7.3] A rule of conduct or an action prescribed or formally recognized as binding or enforced by a controlling authority is a(n) _____.

28. [LO 7.3] A(n) _____ is a set of written rules, procedures, or guidelines that examines values, actions, and choices to help determine right from wrong.

29. [LO 7.3] _____ results in patient injury caused by a breach in the duty of care to the patient.

30. [LO 7.1] A test for which a specimen must be collected immediately is a(n) _____ test.

31. [LO 7.6] When a chemical in the blood is normally higher at one time of the day and lower at another, it is showing a(n) _____.

D: Sequencing

Place the following in the correct order of performance (from 1 to 6).

32. [LO 7.4] _____ Collect blood specimens.

33. [LO 7.4] _____ Deliver specimens to the laboratory.

34. [LO 7.4] _____ Examine the requisitions.

35. [LO 7.4] _____ Label specimen collection tubes.

36. [LO 7.4] _____ Proceed to next patient if not a STAT order.

37. [LO 7.4] _____ Verify patient identification.

E: Case Studies/Critical Thinking

38. [LO 7.6] You are sent to collect blood from a newborn. When you arrive, the infant has been crying excessively and the mother insists that you go ahead and draw the blood. What should you do?

39. [LO 7.3] Your patient, Mr. Tykodi, is not in his hospital room and you happen to see him in the family waiting area with his grandson. There are a number of other patients with their families in the waiting area, several with young children. You approach Mr. Tykodi and tell him you are here to draw his blood. He says, "Why not do it here in the sunshine?" What are your concerns about this situation? What would you do?

40. [LO 7.2] You are on the pediatric floor, and Jennifer Burnham, a 5-year-old girl, needs to have her blood drawn for a blood test. You enter her room and notice she is alone. You inform Jennifer you are there to take a blood test. She starts to cry and says, "Please, no more needles!" What would you do?

41. [LO 7.4] You are on your morning rounds on the fifth floor of the hospital. John Stallings in room 250 is scheduled to have blood drawn. When you enter the patient's room, he identifies himself as James Stallings, but the armband says John Stallings. What is your next step?

42. [LO 7.5] You are going back to the laboratory to drop off your first set of specimens. As you begin to log the samples into the computer system, you find that you are missing a label on one of the specimens. What do you do?

F: Exam Prep

Choose the best answer for each question.

43. [LO 7.1] Which of the following does not necessarily need to be on a laboratory requisition?

- **a.** Laboratory accession number
- **b.** Ordering physician information
- **c.** Patient's name and date of birth
- **d.** Type of test to be performed

44. [LO 7.1] Which of the following pieces of information found on a specimen label is *not* optional?

- **a.** Computerized bar code
- **b.** Laboratory accession number
- **c.** Volume and type of anticoagulant tube required
- **d.** Time the specimen was collected

45. [LO 7.5] Specimen tubes should be labeled in this order:

- **a.** after obtaining the requisition, before leaving the laboratory.
- **b.** after entering the patient's room, before collecting the specimen.
- **c.** after collecting the specimen, before leaving the patient's room.
- **d.** after performing all collections, on arriving back in the laboratory.

46. [LO 7.2] Which of the following behaviors will *not* help calm an anxious patient?

- **a.** Talking quickly and being direct
- **b.** Showing respect and concern
- **c.** Using a pleasant tone of voice
- **d.** Dressing and acting professionally

47. [LO 7.3] Appropriate behavior for maintaining your own privacy includes

- **a.** not identifying yourself; patients know what you want.
- **b.** providing business cards with your contact information.
- **c.** not displaying your name badge when entering patient rooms.
- **d.** stating only your first name when introducing yourself.

48. [LO 7.2] What is the most appropriate way to enter an inpatient room?

- **a.** Walk in and ask if the patient is here, using her first and/or last name.
- **b.** Walk in, introduce yourself, and proceed to check the patient's wristband.
- **c.** Knock, walk in, introduce yourself, and ask for the patient by name.
- **d.** Knock while asking permission to enter, introduce yourself, and ask the patient her name.

49. [LO 7.5] Which of the following specimens will *not* be accepted by the laboratory and must be re-collected? *(Choose all that apply.)*

- **a.** A specimen without a label that the person who collected it can identify
- **b.** A specimen with its label upside down
- **c.** A specimen with a computer label for "John Smith" affixed over handwriting on the tube that reads "Jonathan Smith"
- **d.** A specimen that has a handwritten label for "Mary Jones" but is not yet labeled with the computer label for "Mary Jones"

50. [LO 7.4] How should a patient be identified who cannot speak for himself? *(Choose all that apply.)*

- **a.** Check the name on the door.
- **b.** Check the name on the wristband.
- **c.** Check the name above the bed.
- **d.** Check the name with the unit nurse.

51. [LO 7.3] How should you respond when patients ask about their lab tests? *(Choose all that apply.)*

- **a.** Tell them that they don't need to know anything at this time.
- **b.** Inform them that you are not allowed to tell them anything.
- **c.** Tell them what it says on the requisition, but no more.
- **d.** Ask them to ask their doctor to explain the tests to them.

52. [LO 7.3] Why should you *not* collect blood from a sleeping patient? *(Choose all that apply.)*

a. She might get startled.
b. She might not consent to the procedure.
c. She might jerk her arm unexpectedly.
d. She cannot help during the procedure.

53. [LO 7.3] If you collect a blood specimen on a patient who has not given consent, he might bring a civil lawsuit for

a. assault.
b. battery.
c. direct injury.
d. negligence.

54. [LO 7.3] If a patient feels threatened by the phlebotomist, she may bring suit against the phlebotomist under civil law for

a. assault.
b. battery.
c. direct injury.
d. negligence.

55. [LO 7.3] Which of the following is *not* acceptable for patient consent concerns?

a. Patients give consent by simply being admitted to the hospital.
b. The phlebotomist explains the procedure and asks permission to proceed.
c. An interpreter explains the procedure to non-English-speaking patients.
d. Parents give consent for procedures on their child.

56. [LO 7.6] How much time without food or drink is considered fasting?

a. 4 to 6 hours
b. 2 to 4 hours
c. 6 to 7 hours
d. 8 to 12 hours

57. [LO 7.6] Which of the following actions by the patient will *least* likely affect fasting-level test results?

a. Chewing sugarless gum
b. Drinking tea or coffee without sugar
c. Smoking cigarettes
d. Drinking water

58. [LO 7.6] The serum of a specimen appears slightly cloudy after centrifugation. This is a clue that

a. the patient is in a basal state.
b. the patient is smoking cigarettes.
c. the patient was not fasting.
d. the centrifuge is malfunctioning.

59. [LO 7.6] Which of the following tests most often needs a fasting specimen?

a. Complete blood count
b. Triglycerides and other lipids
c. Therapeutic drug monitoring
d. Vitamin levels

60. [LO 7.6] A postprandial specimen collection should occur

a. after a blood transfusion.
b. before the next dose of medication.
c. early in the morning.
d. at a specific time after eating.

61. [LO 7.6] What specimens are most likely to be collected only early in the morning? *(Choose all that apply.)*

a. Basal state
b. Diurnal analytes
c. Fasting
d. Postprandial

62. [LO 7.6] What specimens are most likely to be collected for therapeutic drug monitoring? *(Choose all that apply.)*

a. Fasting
b. Peak
c. Postprandial
d. Trough

63. [LO 7.7] The time of collection that appears on the computer label

a. does not matter.
b. should be as exact as possible.
c. is only a suggested time of draw.
d. is randomly assigned by the computer.

64. [LO 7.4] If the patient has a name change,

a. both names should be recorded in the EMR.
b. always use the most current.
c. only use the legal name.
d. there is no need to ask for clarification.

65. [LO 7.3] In order to comply with HIPAA, what should you do when leaving the computer on a phlebotomy cart?

a. Leave the screen available to nurses who pass by so that they know which specimens you are collecting.

b. For each patient, turn off the computer and reboot to obtain information on the next.

c. Turn the screen so that no one else can see the screen.

d. Face the screen toward the patient so that he/she can see the information.

Enhance your learning by completing these exercises and more at connect.mheducation.com.