1 Phlebotomy and Healthcare

essential terms

- American Medical Technologists (AMT)
- aseptic
- Centers for Disease Control and Prevention (CDC)
- Centers for Medicare & Medicaid Services (CMS)
- Clinical and Laboratory Standards Institute (CLSI)
- clinical chemistry
- Clinical Laboratory Improvement Amendments (CLIA '88)
- College of American Pathologists (CAP)
- Commission on Office Laboratory Accreditation (COLA)
- cytology
- dermal (capillary) puncture
- Department of Health and Human Services (HHS)
- Environmental Protection Agency (EPA)
- Food and Drug Administration (FDA)
- hematology
- histology
- immunohematology (blood bank)
- immunology
- medical microbiology
- microsurgery
- molecular diagnostics
- National Accrediting Agency for Clinical Laboratory Sciences (NAACLS)
- Occupational Safety and Health Administration (OSHA)
- patient advocate
- phlebotomist
- phlebotomy
- physician office laboratory (POL)
- point-of-care testing (POCT)
- pre-examination
- professionalism
- reference laboratory
- serology
- The Joint Commission (TJC)
- toxicology
- urinalysis
- venipuncture

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Learning Outcomes

1.1 Summarize the definition and history of phlebotomy.

1.2 Explain the role of the phlebotomist in the various healthcare facilities where he or she may be employed.

1.3 Describe inpatient and outpatient healthcare facilities and their relationship to the practice of phlebotomy.

1.4 Identify the healthcare providers and other members of the healthcare team with whom the phlebotomist will interact in inpatient and outpatient facilities.

1.5 Outline the organization of the medical laboratory.

1.6 Recognize the agencies that regulate hospitals and medical laboratories.

1.7 List the qualities and characteristics of a phlebotomist.

Related NAACLS Competencies

1.1 Demonstrate knowledge of the healthcare delivery system and medical terminology.

1.2 Identify the healthcare providers in hospitals and clinics and the phlebotomist's role as a member of this healthcare team.

1.3 Describe the various hospital departments and their major functions in which the phlebotomist may interact in his/her role.

1.4 Describe the organizational structure of the clinical laboratory department.

1.5 Discuss the roles of the clinical laboratory personnel and their qualifications for these professional positions.

1.6 List the types of laboratory procedures performed in the various sections of the clinical laboratory department.

7.3 Instruct patients in the proper collection and preservation for non-blood specimens.

9.1 Communicate (verbally and nonverbally) effectively and appropriately in the workplace.

9.4 Interact appropriately and professionally with other individuals.

9.7 Model professional appearance and appropriate behavior.

Introduction

This chapter introduces the role of the phlebotomist in the delivery of healthcare. It includes information about the phlebotomist's duties in several healthcare settings. In addition, it briefly describes various disciplines within the field of healthcare, including the medical laboratory. The chapter also describes the governmental agencies that regulate how specimens are collected, handled, and tested.

1.1 Phlebotomy

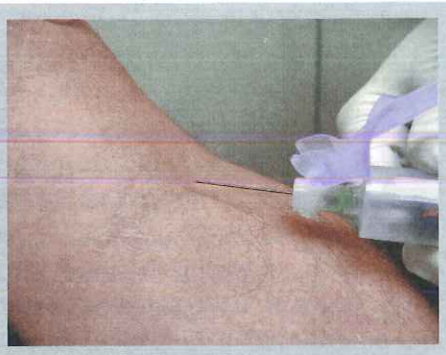
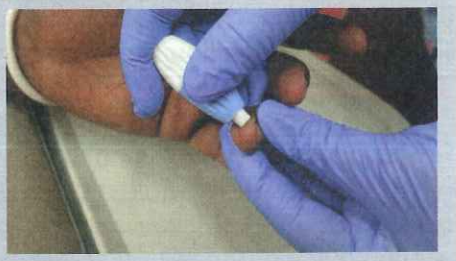
Phlebotomy simply means to cut into a vein. The term comes from *phlebos,* which is Greek for "vein," and *tome,* which means "to cut." Professionals called *phlebotomists* perform this invasive procedure that involves making an incision into the skin and blood vessels.

Results of laboratory testing are crucial in providing appropriate, quality healthcare. Over 70% of medical decisions are based on laboratory test results. The primary role of a **phlebotomist** is to obtain blood specimens that provide test results for chemicals such as glucose, proteins, drugs, blood cell counts, antibodies, and infectious diseases. Blood is obtained either by **venipuncture** (puncturing a vein) or **dermal (capillary) puncture** (puncturing the skin). The terms ***phlebotomy*** and *venipuncture* are often used interchangeably, as are *dermal puncture* and *capillary puncture* (see Table 1-1).

History of Phlebotomy

The process of removing blood from the veins may date back as far as 1400 BC; an Egyptian tomb painting shows a leech being applied to the skin of a sick person. Bloodletting was thought to rid the body of impurities and evil spirits or, as in the time of Hippocrates, simply to return the body to a balanced state, also known as homeostasis. Hippocrates is known as the father of medicine and is the originator of the Hippocratic Oath. Figure 1-1 shows a painting of bloodletting from this era. As recently as the 1800s, anyone claiming medical training could perform bloodletting. Barbers—not unlike those working in salons today—frequently performed bloodletting procedures. The look of the barber pole is linked to bloodletting, with red representing blood and white

TABLE 1-1 Two Common Collection Methods

Venipuncture	Insertion of a needle into a vein to allow blood flow into a vacuum tube or syringe	 Total Care Programming, Inc.
Dermal (Capillary) puncture	Use of a lancet or puncture device to prick the skin to remove a small specimen of capillary blood	 Lillian Mundt

representing the bandages used to stem the bleeding. The pole itself is said to symbolize the stick that a patient squeezed to make the veins in their arm stand out more prominently for the procedure.

In the early 1800s, the popularity of bloodletting created an enormous demand for leeches. Leeches are segmented worms that have two suckers, one at each end. Most leeches live in freshwater environments. One type of leech feeds on blood making it useful in medical treatments. Leech farms were established to breed them under controlled conditions. Interestingly, the use of leeches has resurfaced in medicine today (see Figure 1-2). They are prescribed to remove blood that has collected at newly transplanted tissue sites and to decrease the swelling following **microsurgery** (which involves the reconstruction of small tissue structures). Leeches have both anticoagulant

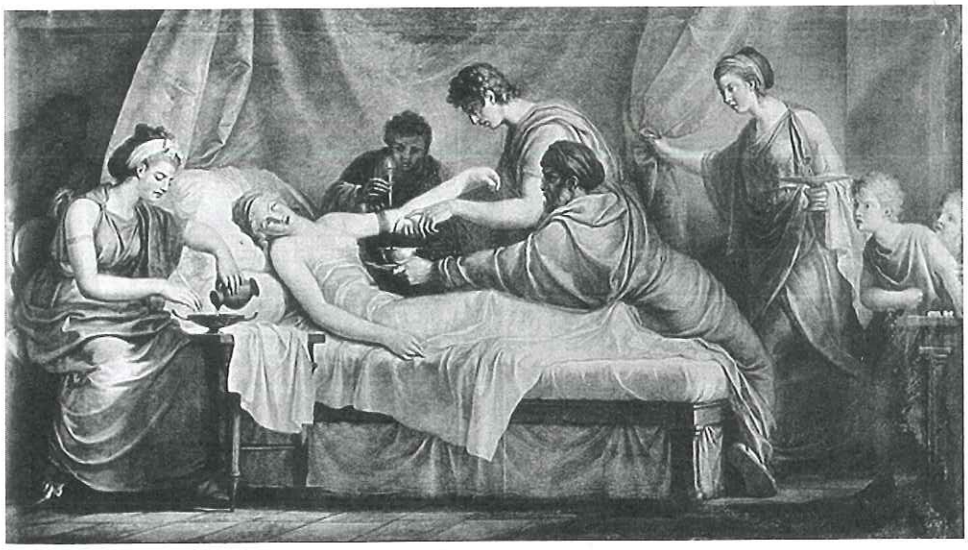


Figure 1-1 Early Romans used bloodletting as a form of healing.
Bettmann/Getty Images

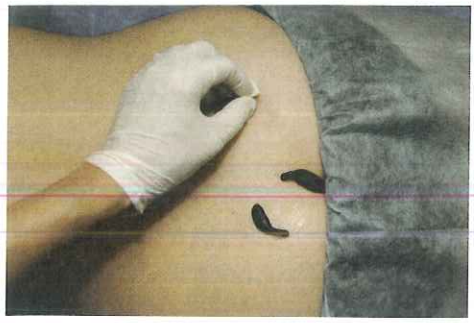


Figure 1-2 Leeches are still used today for localized removal of impurities from the blood.
Mikhail Malyshev/Shutterstock

and vasodilation properties. Medicinal leeches may be found in a hospital pharmacy.

Bloodletting also used a process called *venesection,* in which the vein was pierced with a sharp object, called a *lancet,* to drain blood. The lancet, a short, wide, pointed blade, was the most popular medical instrument during the 1800s. Venesection was thought to be an effective procedure for removing unwanted diseases from the body and reducing fever. It is important to note that **aseptic,** or microorganism-free, practices were unknown during that time, so the same lancet was used on several patients without any cleansing.

Another method used for bloodletting was called "cupping." This method produced a vacuum effect by pulling blood to the capillaries under a heated glass cup, which was placed on the patient's back to allow for increased blood flow. Then, a spring-loaded box containing multiple blades pierced the skin to produce bleeding. The procedure typically caused scar tissue.

It was during the 1980s and 1990s that the phlebotomy profession emerged as a result of technology and an expansion of laboratory functions. Initially, only medical laboratory scientists (MLSs, formerly known as medical technologists) and medical laboratory technicians (MLTs) were responsible for collecting blood specimens. However, as technology and the healthcare industry underwent rapid changes, specimen collection was delegated to other groups of trained professionals, including medical assistants, nurses, paramedics, and phlebotomists. At all times during their professional practice, phlebotomists must demonstrate a mastery of the principles and techniques established by the **Clinical and Laboratory Standards Institute (CLSI).**

Checkpoint Questions 1.1

1. What does the word *phlebotomy* mean?
2. What is the difference between venipuncture and dermal (capillary) puncture?
3. Which organization established the principles and techniques that professional phlebotomists must master?
4. When did phlebotomy first emerge as a profession?

1.2 Phlebotomist's Role

The phlebotomist is a valuable member of the healthcare team and is responsible for the collection, processing, and transportation of blood specimens to the laboratory. This is known as the **preexamination** (preanalytical) phase of laboratory testing. Other roles of the phlebotomist may include the removal of blood from donors for blood transfusions and from patients with a condition called *polycythemia* (overproduction of red blood cells), in which blood must be removed to decrease its viscosity (thickness). Phlebotomists may also give instructions to patients on how to properly collect a urine or fecal specimen, and they are responsible for properly packaging specimens (blood, urine, fecal, cultures, and body fluids). In some settings, the phlebotomist's job also includes accepting incoming specimens, logging specimens into the computer system, and routing specimens to the proper departments for testing and analysis. As a member of the healthcare team, the phlebotomist may assume other responsibilities. For example, at inpatient facilities, a phlebotomist also

trained as a patient care technician (PCT) may perform additional duties such as delivering meal trays or assisting with the transportation of patients from one department to another. At outpatient facilities, a phlebotomist trained as a medical assistant (MA) may take vital signs and assist the healthcare provider with patient examinations.

While performing these various duties, phlebotomists may also have the opportunity to assist patients who are confused or overwhelmed by their healthcare needs. This is known as *patient advocacy.* A **patient advocate** helps guide patients through the healthcare system. This may include tasks such as helping a patient schedule a needed appointment or simply providing directions within or to a healthcare facility where the patient has medical tests or other appointments scheduled. Patient advocates help patients become more comfortable with the healthcare system.

Several other members of the healthcare team, such as physicians, nurses, medical assistants, paramedics, and patient care technicians, are also trained to perform phlebotomy. Just as the role of these healthcare team members may include phlebotomy, a phlebotomist may be responsible for performing a variety of other duties such as: transporting other specimens (arterial blood, urine, sputum, and tissue) to the laboratory for testing, providing basic first aid and performing CPR, assisting other healthcare professionals with specimen collection, training new staff, interpretation of laboratory test orders, and providing results to healthcare providers.

The phlebotomist may also be responsible for performing **point-of-care testing (POCT),** such as blood glucose monitoring. Point-of-care testing is performed at the patient's bedside or a work area using portable instruments. POCT can assist the physician in making diagnoses more quickly, which often reduces the length of stay for hospitalized patients. POCT procedures are explained in the chapter *Waived Testing*. In addition, phlebotomists perform quality control testing and various clinical and clerical duties. Table 1-2 summarizes the essential duties and responsibilities of the phlebotomist.

The phlebotomist must be familiar with the process, equipment, and variables involved in venipuncture and dermal (capillary) puncture procedures to obtain quality specimens while maintaining patient safety. Nothing is more important in healthcare delivery than patient safety. This means safety not only in the performance of procedures but also in the proper handling of specimens to promote accurate test results, which will influence a patient's diagnosis and treatment. The quality of the specimens sent to the laboratory determines the accuracy of the test results obtained. There is nothing laboratory scientists can do to obtain accurate results on compromised specimens. The phlebotomist is

TABLE 1-2 Duties and Responsibilities of the Phlebotomist

- Demonstrate professional attire, attitude, and communications
- Observe all safety regulations
- Know and follow the facility's policies and procedures
- Properly identify patients
- Collect both venous and capillary blood specimens
- Select the correct specimen container for the specified tests
- Properly label, handle, and transport specimens following departmental policies
- Sort specimens received and process specimens for delivery to laboratory departments
- Perform computer operations and/or update log sheets where required
- Perform point-of-care testing and quality control checks

responsible for obtaining the highest-quality specimen possible and ensuring that it is handled properly during transport to the laboratory.

Phlebotomy Training

Entry into phlebotomy training programs usually requires a high school diploma or its equivalent. Training programs are typically offered at hospitals, technical and private schools, and community colleges as well as through continuing education courses. The course can vary from a few weeks to a few months in length, depending on the program.

Various agencies, such as the **National Accrediting Agency for Clinical Laboratory Sciences (NAACLS)** and **American Medical Technologists (AMT)** have established standards to which approved programs must adhere. Programmatic approval ensures that students completing the training program are qualified to take a certification examination. In some states, phlebotomists must be both certified and licensed. Certification and licensure are discussed further in the chapter *Practicing Professional Behavior*.

Checkpoint Questions 1.2

1. Briefly describe the role of the phlebotomist in the delivery of healthcare.
2. What is point-of-care testing?
3. What is the most important duty and concern of the phlebotomist?

1.3 Healthcare Facilities

The two main categories of healthcare delivery systems in the United States are inpatient and outpatient services. Phlebotomists are employed in both of these settings as well as in special settings.

Inpatient Facilities

Figure 1-3 An inpatient laboratory is known as a clinical laboratory; personnel perform a wide range of laboratory tests.
David Buffington/Getty Images

Hospitals, nursing homes, and rehabilitation centers, where patients stay for one night or long term, are examples of inpatient facilities. Phlebotomists employed at inpatient facilities work directly with several members of the healthcare team. Phlebotomists may be part of the medical laboratory staff (see Figure 1-3) or patient care technicians (PCTs) with phlebotomy responsibilities. Physicians order specific tests to assist with the evaluation of the patient's condition, and the phlebotomist's role is to collect the blood, properly label the specimen, and transport it to the laboratory.

Outpatient Facilities

Outpatient settings include physician offices, ambulatory care centers, and blood collection centers, where patients visit for a short time and leave the same day. In most cases, hospital emergency departments are also considered outpatient facilities. In addition, phlebotomists work for home healthcare agencies, which require them to collect blood in the patient's home. Other special settings include veterinary offices, health maintenance organizations (HMOs), the American Red Cross, and insurance companies, to

name a few. The phlebotomist's duties within outpatient facilities vary; however, collecting and processing blood specimens are consistent duties throughout every type of healthcare facility the phlebotomist encounters.

The fastest-growing outpatient settings are ambulatory care centers. These sites are walk-in facilities that patients can go to not only during the day but also after business hours and on weekends, when most physician offices are closed. Lab tests involving chemistry, hematology, urinalysis, serology, coagulation studies, and microbiology are ordered to assist with the diagnosis and treatment of minor conditions, such as sore throat, urinary tract infection, and therapeutic drug monitoring. In addition to blood collection, phlebotomists working in this setting are responsible for providing instructions to the patient on how to properly collect a urine, fecal, or other specimen. Phlebotomists in these settings may also be responsible for performing other basic patient care duties that include obtaining vital signs and transporting patients for procedures (such as X-rays).

Physician offices are also considered outpatient facilities. Phlebotomists and medical assistants are usually responsible for collecting and labeling a variety of specimens in the physician office, which are then transported to a **reference laboratory** (off-site laboratory) for testing. A physician office laboratory (POL) may perform only basic lab tests according to the certification it has been granted by the Clinical Laboratory Improvement Amendments (CLIA). Waived tests are the most common and, as defined by CLIA, are "simple laboratory examinations and procedures that have an insignificant risk of erroneous result." These tests are typically performed on small amounts of blood and other specimens such as urine. Waived tests are discussed in more detail in the chapter *Waived Testing*. (See Figure 1-4.)

Nasal smears to determine if infection is present and simple blood tests such as cholesterol are approved for in-office tests. Therefore, depending on the facility of employment, a phlebotomist may be required to perform some of these tests as well as quality control checks on any test they performs.

Other outpatient facilities, such as blood banks and the American Red Cross, employ phlebotomists to collect donor blood. The collected blood becomes a unit that might be used for a blood transfusion. Phlebotomists working for agencies are often hired to go into patient homes to collect blood specimens. As healthcare delivery systems change, more care is being provided to patients in nursing homes and in their own residences. Some medical centers provide mobile venipuncture, in which the phlebotomist goes to the patient's home to obtain blood specimens. Additionally, insurance agencies hire phlebotomists to perform in-home phlebotomy as a way of determining a customer's overall health before an insurance policy is written. Other facilities that hire phlebotomists include complementary and alternative medicine (CAM) settings, such as chiropractor offices. Regardless of the work setting, the proper collection, labeling, and handling of all specimens are critical measures for ensuring accurate test results. These steps must be followed correctly to prevent the need for repeating a test unnecessarily or, worse yet, the misdiagnosis or mistreatment of a disorder.

Figure 1-4 A medical assistant or phlebotomist in a physician office laboratory performs "waived" tests, which carry fewer risks to the patient.
nandyphotos/iStock/Getty Images

Checkpoint Questions 1.3

1. Name two types of inpatient facilities.
2. List at least four types of outpatient facilities in which phlebotomists may work.

1.4 The Healthcare Team

Whether they are members of the laboratory staff or a nursing unit, phlebotomists must be aware of the healthcare specialties and the professionals found in medical settings. The following pages explain some of the most common healthcare specialties.

- *Anesthesiology* is the management of pain before, during, and after surgery. Anesthesiologists and nurse anesthetists provide this service.
- *Cardiology* is the study, diagnosis, and treatment of conditions pertaining to the heart and cardiovascular system. The cardiologist is a medical doctor who specializes in disorders of the heart and cardiovascular system.
- *Diagnostic imaging (radiology)* involves the use of ionizing radiation, X-rays, and specialized procedures such as computed tomography (CT) scans, positron emission tomography (PET), magnetic resonance imaging (MRI), and ultrasound to produce diagnostic images. Radiologic technicians and technologists produce these images, which are then interpreted by radiologists. Radiologists are medical doctors who specialize in diagnosing and treating disease using radiation and imaging processes.
- *Electrocardiography* is the study of the heart's electrical patterns. Nurses, medical assistants, or ECG technicians place electrodes on the skin and record electrical patterns, which are interpreted by cardiologists.
- *Electroencephalography* is the study of electrical activity of the brain. Nurses and EEG technicians place electrodes on the scalp. Neurologists, who are physicians specializing in nervous system disorders, interpret brain activity recordings.
- *Emergency department* physicians and nursing staff specialize in the delivery of acute care for initial treatment of life-threatening or otherwise unplanned medical events. Phlebotomists may need to interact with various healthcare professionals in the emergency department as they respond to trauma assessment and treatment needs.
- *Endocrinology* is the study, diagnosis, and treatment of hormone disorders. Endocrinologists are medical doctors specializing in disorders of the hormone-producing organs and tissues.
- *General medicine (family practice)* is the general care of patients of all ages. Family practice physicians, physician assistants, and nurse practitioners provide this kind of care.
- *Geriatrics* is the diagnosis and treatment of disorders associated with elderly patients. Gerontologists are medical doctors specializing in disorders of elderly individuals.
- *Internal medicine* is the diagnosis and treatment of disorders related to the internal organs. Physicians who are internists provide this type of care. It is also a common practice area for osteopathic physicians, physician assistants, and nurse practitioners.
- *Neonatology* is the study, diagnosis, and treatment of disorders associated with newborns. Nurses and other healthcare professionals care for these infants, treated by neonatologists, who are medical doctors specializing in disorders of newborns and prematurely born infants.
- *Nephrology* is the study, diagnosis, and treatment of disorders of the kidneys. Physicians specializing in kidney disorders may be nephrologists or urologists.

- *Neurology* is the study, diagnosis, and treatment of disorders of the brain and nervous system. Neurologists are medical doctors specializing in disorders of the brain and nervous system.
- *Nuclear medicine* is the use of injectable radionuclides to diagnose and treat diseases, such as tumors. Medical radiation physicists and physicians specializing in radiotherapy customize treatments for patients based on their disease state and the needs of their particular anatomy.
- *Nutrition and dietetics* is responsible for ensuring that patients receive proper nutritional intervention during and after their hospital stay. Registered dietitians supervise food preparation, develop modified diet plans, and provide special nutrient preparations to patients unable to consume food normally.
- *Obstetrics/gynecology* is the study, diagnosis, and treatment of the female reproductive system. Physicians who are obstetricians and/or gynecologists, as well as nurse practitioners, provide this kind of care.
- *Occupational therapy* enables people to perform meaningful and purposeful activities within the limits of a disability. Occupational therapists and occupational therapy assistants provide this service to people of all ages by using everyday activities as a part of therapy.
- *Oncology* is the study, diagnosis, and treatment of malignant tumors. Oncologists are medical doctors specializing in the study of cancerous tumors.
- *Orthopedics* is the diagnosis and treatment of bone and joint disorders. An orthopedic surgeon provides surgical intervention for these disorders. Physical therapists provide rehabilitation services under the direction of an orthopedic specialist.
- *Pathology* is the study and diagnosis of disease. Pathologists are medical doctors who specialize in this field of medicine. Medical laboratory personnel often work closely with pathologists.
- *Pediatrics* is the diagnosis and treatment of disorders associated with children. Pediatricians are medical doctors specializing in disorders of children.
- *Pharmacy* ensures the safe and effective use of therapeutic drugs. Pharmacists and pharmacy technicians dispense physician-prescribed medications and use laboratory results in monitoring appropriate dosages.
- *Physical therapy* is a rehabilitative science that focuses on the development, maintenance, and restoration of maximum movement and functional ability. Physical therapists and physical therapy assistants provide this service to people of all ages, particularly to those whose movement and functionality are threatened by aging, injury, disease, or environmental factors.
- *Psychiatry* is the study and treatment of mental disorders. Psychiatrists are medical doctors specializing in affective, behavioral, cognitive, and perceptual disorders.
- *Respiratory therapy* is the assessment and treatment of breathing disorders. Respiratory therapists, also known as respiratory care practitioners, provide this service through airway management and mechanical ventilation. They work with the laboratory or may perform their own laboratory tests for acid-base balance and blood gas levels.
- *Surgery* uses operative techniques to investigate and treat a pathological condition or to improve bodily function or appearance. General surgeons

and surgeons specializing in a specific type of procedure provide this service and are assisted by surgical nurses and surgery technicians.

- *Urology* is the study, diagnosis, and treatment of male and female urinary tract disorders and disorders of the male reproductive system. Physicians specializing in these disorders may be urologists or nephrologists.

These descriptions represent only a sample of the numerous specialties that constitute the medical system. A diverse group of medical specialists cooperate and function as a healthcare team in order to achieve the greatest benefit for the patient (customer). By understanding these different roles and services, the phlebotomist is better prepared to perform a variety of duties for almost any healthcare facility.

Checkpoint Questions 1.4

Match the following medical specialties with their role in healthcare.

_____ 1. cardiology
_____ 2. pharmacy
_____ 3. physical therapy
_____ 4. psychiatry
_____ 5. respiratory therapy

a. monitoring and adjustment of medication dosages
b. restoration of movement and functional ability
c. diagnosis and treatment of heart conditions
d. assessment and treatment of breathing disorders
e. study and treatment of mental disorders

1.5 The Medical Laboratory

Most hospitals have their own laboratories, which are referred to as *medical* or *clinical* laboratories because they perform a wide range of tests in several specialties.

Each laboratory is organized based on its individual size and complexity. Organizational charts similar to the example in Figure 1-5 are used to show the chain of accountability in the medical laboratory. A hospital laboratory is typically segmented into clinical pathology and anatomical pathology departments. Clinical pathology is the laboratory analysis of body fluids and body tissue for the diagnosis of disease. Anatomical pathology involves the examination of surgical specimens and in some cases the whole body (autopsy) to investigate disease and/or cause of death.

A laboratory manager (director), who is an administrative medical laboratory scientist, is usually responsible for the overall operation of the laboratory. A pathologist, who is the medical director, is usually responsible for the operation of the anatomical or clinical portion of the laboratory. This division of responsibility may vary based on state regulations. Individual hospital laboratories usually have supervisors who oversee operations for each of the main sections of the laboratory, whereas multihospital organizations may have regional supervisors who travel from site to site, managing operations for their section at each site. Where regional supervisors are used, lead technologists are responsible for the daily functions of laboratory sections. Technicians and scientists perform laboratory tests requested by patients' physicians.

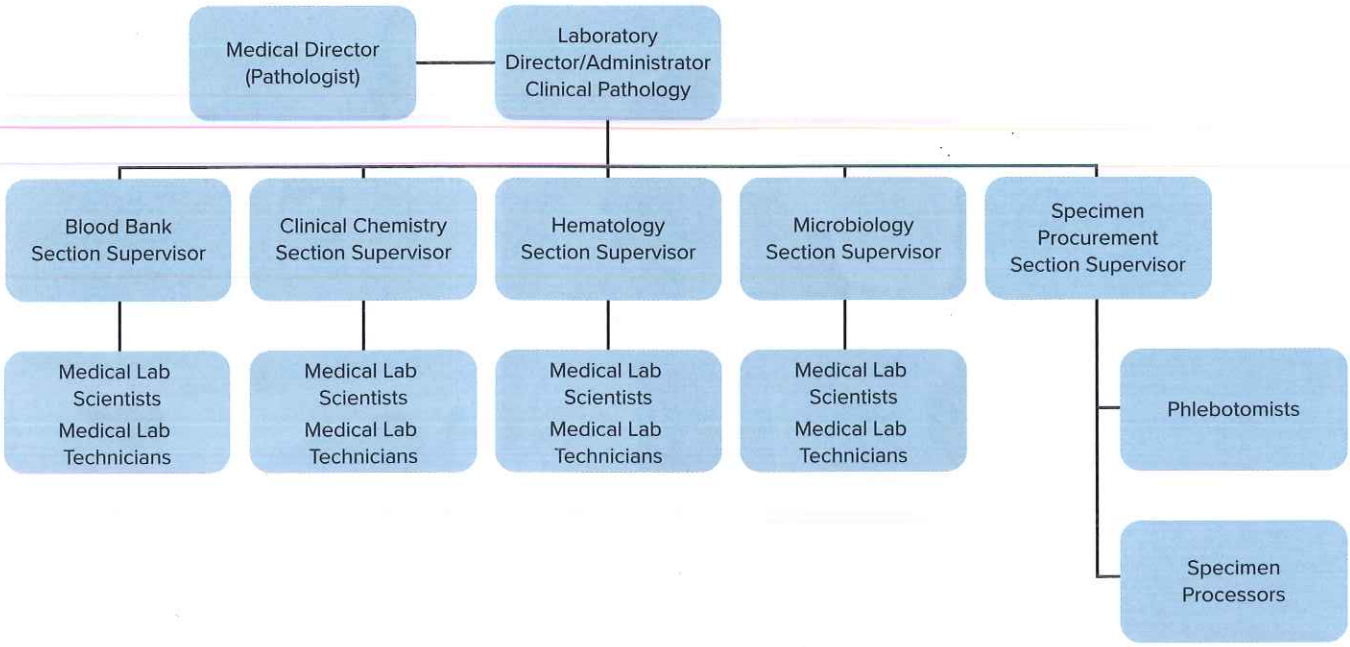


Figure 1-5 Organizational charts similar to this one are used by medical laboratories.

Phlebotomists collect and provide the specimens on which these tests are performed.

Medical Laboratory Specialties

Specialty areas of the medical laboratory, along with some of the tests performed in each area, include the following:

- ***Cytology*** is the investigation of human cells for the presence of cancer. The most common specimens examined by cytologists are gynecological specimens known as Pap smears. (See Figure 1-6.)
- ***Histology*** is the study of human body tissues and cells. Surgical specimens are sent to histology to be prepared and stained by histology technicians. (See Figure 1-7.)

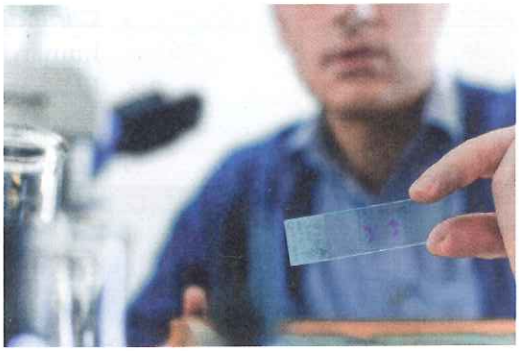


Figure 1-6 Cytology is responsible for examining prepared tissue cells for the presence of cancer.
Corbis/Image Source

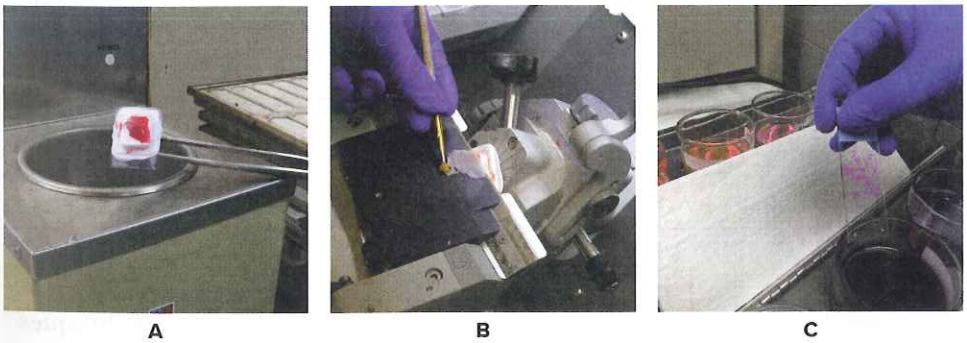


Figure 1-7 Histology is responsible for (A) embedding surgically removed tissues in paraffin, (B) cutting ultrathin slices of the embedded tissue, and (C) affixing them to slides and applying various stains.
a–c: Lillian Mundt

Figure 1-8 The chemistry section of a medical laboratory uses automated analyzers to allow for many tests to be performed in a short amount of time.
Montgomery Martin/Alamy Stock Photo

Figure 1-9 This hematology technician is preparing to examine a blood smear.
ERproductions Ltd/Blend Images LLC

- ***Clinical chemistry*** is the evaluation of the chemical constituents of the human body. Laboratory personnel determine levels of enzymes, glucose, hormones, lipids, proteins, vitamins, iron and other nutrients, therapeutic drugs, drugs of abuse, and trace elements, such as lead. (See Figure 1-8.)
- ***Hematology*** is the study of blood and blood-forming tissues; it also includes evaluation of hemostasis (coagulation system). Laboratory personnel perform complete blood counts, coagulation tests, bone marrow analysis, body fluid cell counts, and special tests for red blood cell and white blood cell disorders. (See Figure 1-9.)
- ***Immunohematology (blood bank)*** involves collection and preparation of donor blood for transfusion. Donor phlebotomists screen donors and collect units of blood. Laboratory personnel perform blood group and type analysis and cross-matches, prepare and issue blood products, and conduct transfusion reaction investigations. (See Figure 1-10.)

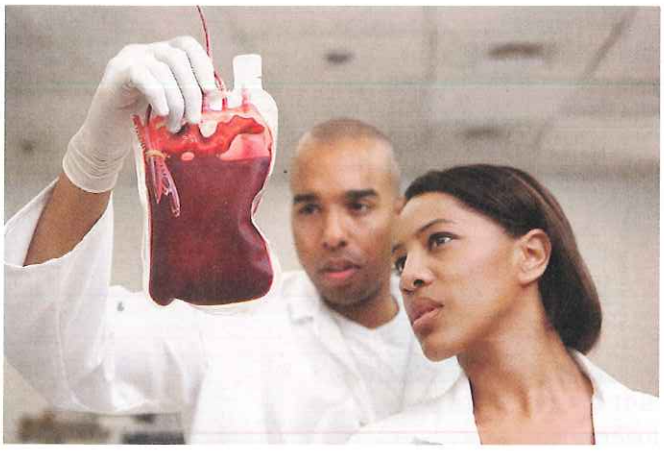


Figure 1-10 The blood bank ensures that blood components are safe for use in transfusion therapy.
ERproductions Ltd/Blend Images LLC

- ***Immunology*** and ***serology*** are the study of the body's resistance to disease and defense against foreign substances. Some of the immunology tests that laboratory personnel perform include antinuclear antibody (ANA), Monospot, rapid plasma reagin (RPR), and rapid tests for Group A streptococcus (strep), HIV, Flu, RSV, and SARS (COVID-19). (See Figure 1-11.)
- ***Medical microbiology*** is the study of medically significant microscopic organisms. In the clinical setting, laboratory personnel perform techniques to identify pathogenic bacteria, fungi, parasites, and viruses. In addition, they identify microorganism resistance or susceptibility to specific antibiotics. (See Figure 1-12.)

Figure 1-11 Immunology personnel are responsible for detecting the presence of infectious diseases.
Noel Hendrickson/Getty Images

Figure 1-12 Cultures of various specimens are analyzed in the medical microbiology area to identify the causative agent of infections and to determine the appropriate antibiotic to use in combating bacterial infections.
Corbis/VCG/Getty Images

- ***Molecular diagnostics*** is the detection and classification of disease states using molecular and DNA-based testing. Laboratory personnel may perform molecular tests for infectious diseases, such as chlamydia, gonorrhea, gastrointestinal pathogens, respiratory pathogens (including COVID-19) and human papillomavirus (HPV). Some molecular labs perform flow cytometry procedures for classification of leukemia and lymphoma; and DNA-based tests, such as gene mutations and tumor cell ploidy analysis. (See Figure 1-13.)
- ***Toxicology*** is the detection and study of the adverse effects of chemicals on living organisms. Laboratory personnel evaluate blood and body fluids for the presence of trace elements, toxic substances, and drugs. (See Figure 1-14.)

Figure 1-13 Molecular biology techniques involve cellular protein markers or DNA probes to test for various disease conditions.
Corbis/VCG/Getty Images

Figure 1-14 Toxicology may be part of the chemistry section and is responsible for drug testing as well as testing for trace elements and environmental toxins.
Stockbyte/Getty Images

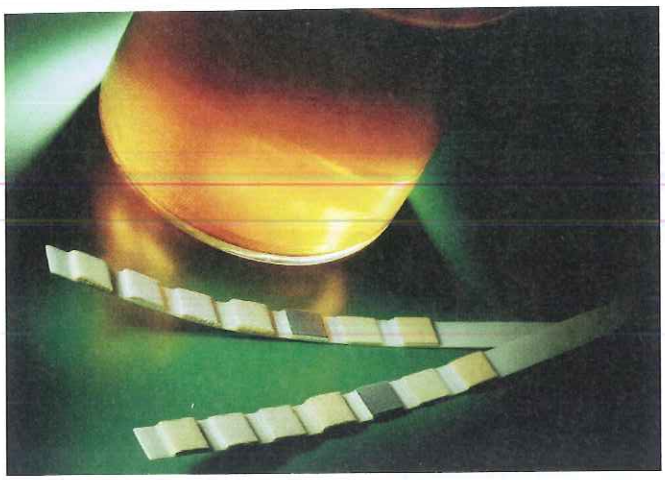


Figure 1-15 Urinalysis testing may be its own section or be performed in another part of the laboratory; it may also be performed in a physician office laboratory.
Steve Allen/Getty Images

- ***Urinalysis*** is the examination of urine for physical, chemical, and microscopic characteristics. Laboratory personnel perform routine urinalysis and special confirmatory tests. The urinalysis section may also be responsible for pregnancy testing and testing of other body fluids. Urinalysis may be performed in the general laboratory or a specific department of the laboratory, such as chemistry or hematology. Urinalysis may also be performed in a physician office laboratory. (See Figure 1-15.)

Providing quality healthcare requires a variety of laboratory professionals. These professionals perform analyses of many types to produce the information physicians need to make diagnoses, to form treatment plans, and to monitor outcomes.

Medical Laboratory Personnel

There are various professionals in the medical laboratory with whom the phlebotomist may interact, including the following:

- *Medical office staff* greet and assist outpatients needing laboratory services.
- *Medical transcriptionists* prepare pathologist-dictated reports.
- *Medical laboratory assistants (MLAs)* are phlebotomists trained to perform low-complexity testing or assist laboratory staff in other ways.
- *Histologic technicians (HTs)* prepare small sections of surgical specimens for microscopic examination by a pathologist.
- *Histologists (HTLs)* perform more complex functions of the histology laboratory and are responsible for the technical aspects of the histology laboratory as well as new procedure evaluation.
- *Cytologists (CTs)* perform microscopic examination of human cells in order to detect cancer and other diseases. In addition, some laboratories employ professionals with master's degrees or PhDs in specific disciplines, such as microbiology or molecular pathology.
- *Pathologists* are medical doctors who specialize in the study of disease, which includes anatomical and clinical pathology. An anatomical pathologist provides diagnoses on surgically removed tissue. A clinical pathologist oversees the interpretation of blood and body fluid test results produced by MLTs and MLSs. Some pathologists also have subspecialties in the various disciplines within the medical laboratory.
- *Pathologists' assistants (PAs)* examine surgically removed tissue samples and collect and examine autopsy specimens. They assist pathologists in the identification of disease states.
- *Medical laboratory technicians (MLTs),* formerly called clinical laboratory technicians by some agencies, have a minimum of an associate's degree and can perform low-complexity and some moderately complex laboratory testing other than cytology and histology. In some states, MLTs may perform some procedures (those requiring interpretation) under direct supervision of medical laboratory scientists.
- *Medical laboratory scientists (MLSs),* formerly called medical technologists or clinical laboratory scientists, have a minimum of a bachelor's degree

and can perform high-complexity testing other than cytology and histology. They are responsible for the technical aspects of the medical laboratory as well as new procedure evaluation. MLSs also have specialties in one or more of the laboratory sections. Some laboratories employ persons with degrees in clinical chemistry or medical microbiology for the position of MLS in specific sections of the medical laboratory.

Medical laboratory technicians and scientists may serve in areas that seem outside the realm of laboratory practice. These areas include laboratory information systems (LIS), marketing and outreach coordination, customer service, and the education of medical laboratory and other medical personnel.

Medical laboratory scientists can also function as the laboratory administrator or laboratory manager. The laboratory manager may have an advanced degree and oversees the day-to-day operations of the laboratory. The laboratory manager works closely with the laboratory's medical director (pathologist) to ensure the quality of laboratory-delivered healthcare.

Checkpoint Questions 1.5

Match the following medical laboratory sections to their laboratory testing responsibility.

_____ 1. cytology
_____ 2. hematology
_____ 3. immunohematology
_____ 4. serology
_____ 5. toxicology

a. studies the adverse effects of chemicals
b. prepares donor blood for transfusion
c. studies the body's resistance to disease
d. detects cancer in gynecological and other specimens
e. studies the blood-forming tissues

1.6 Regulatory Agencies

Regulatory agencies routinely visit and inspect laboratories and medical offices to evaluate quality control and quality assurance. The **Centers for Medicare & Medicaid Services (CMS)** is the main regulatory body for all laboratories and established qualifications for phlebotomists. All laboratories receiving federal funds, regardless of size, type, or location, must meet the same standards and be certified by the federal government. Laboratory facilities must have quality assurance programs in place to ensure that tests are effective and accurate. Quality assurance will be discussed in more detail in the chapter *Quality Essentials*.

Classifications of laboratories are based on the complexity of testing performed and the associated patient risks if the tests are not performed properly. Some laboratories are categorized as *waived* and are not subject to inspections because they perform only simple tests that have minimal associated patient risks, such as dipstick urine testing. Other laboratories are classified as *moderately complex* or *highly complex,* and both undergo inspections. Inspections are stricter for higher-complexity laboratories. Personnel qualifications are specified for various levels of test complexity, which are outlined in the CLIA '88 regulations. Failure of any institution to comply with these regulations may result in termination of Medicare and Medicaid reimbursements as well as loss of privilege to perform the procedure.

Hospital laboratories and physician office laboratories are governed by regulations that provide rules and guidelines for quality patient care. **The Joint**

Commission (TJC) and the **College of American Pathologists (CAP)** are two accrediting agencies that help ensure a high standard of care for patients. The main accrediting agency for hospitals is TJC. The CAP specifically accredits medical laboratories. The **Department of Health and Human Services (HHS)** oversees the Centers for Medicare & Medicaid Services (CMS). CMS is the federal agency that established regulations to implement CLIA '88 as well as the **Commission on Office Laboratory Accreditation (COLA)** for accrediting **physician office laboratories (POLs).** Physician offices must keep records for quality control, temperature readings, and equipment maintenance logs.

The Clinical and Laboratory Standards Institute (CLSI), formerly the National Committee for Clinical Laboratory Standards (NCCLS), is a nonprofit, private, educational organization that develops and publishes national and international standards for clinical laboratory testing procedures. CLSI standards follow the CLIA '88 mandates and assist medical laboratories in adhering to federal regulations. Clinical laboratories use these standards when developing their procedures and policies. Procedures and policies are documents that outline how specimen collection and laboratory tests are to be performed.

CLSI standards have been categorized into three phases: preexamination, examination, and post-examination. The terminology for these phases was adopted by CLSI in 2010 due to preferences of the International Organization for Standardization (ISO), the organization with which CLSI aligns its documents. Table 1-3 shows these changes in terminology and explains their meanings.

TABLE 1-3 Clinical and Laboratory Standards Institute Alignment of Testing Phase Terminology with the International Organization for Standardization

CLSI Terminology Prior to 2010	CLSI Terminology After Global Harmonization, 2010	Definition of Testing Phase
Pre-analytical	Pre-examination	Every step in the testing process that occurs before the actual performance of a laboratory test, including • ordering and requisitioning of tests • patient identification • specimen collection processes, including prioritization • integrity of the specimen (handling and transport)
Analytical	Examination	Every step in the testing process that occurs during the actual performance of a laboratory test, including • quality assurance of equipment and reagents • adherence to SOP (standard operating procedures) • quality control procedures • test analysis and interpretation • resolution of result discrepancies
Post-analytical	Post-examination	Every step in the testing process that occurs after the actual performance of a laboratory test, including • reporting of results • ensuring proper handling of critical results • follow-up on reflex testing • documentation of errors in reporting • documentation of variances to reporting SOP • documentation on corrective action • specimen storage after testing

In addition to the federal government, other agencies oversee various aspects of procedures performed by phlebotomists. The **Centers for Disease Control and Prevention (CDC)** implements public health regulations and reporting requirements for the clinical laboratory and other healthcare providers. The CDC is responsible for categorizing newly developed laboratory tests as waived, moderately complex, or highly complex.

The **Occupational Safety and Health Administration (OSHA)** regulates concerns over worker safety for the clinical laboratory. As employees of the clinical laboratory, phlebotomists have the right to a safe working environment and can report concerns regarding unsafe work practices to OSHA without fear of retaliation.

The **Environmental Protection Agency (EPA)** ensures that healthcare providers follow the *Medical Waste Tracking Act (MWTA)*. The MWTA defines medical waste (laboratory specimens and items contaminated by blood or body fluids) and establishes acceptable practices for treatment and disposal of this waste.

The *Department of Transportation (DOT)* establishes requirements for safe packaging and transport of biologically hazardous and other hazardous materials (HAZMATs), such as used or expired laboratory chemicals. The *Nuclear Regulatory Commission (NRC)* regulates handling and disposal of radioactive materials (radionuclides used in therapy). While the medical laboratory minimizes the use of radioactive materials, there are still some tests involving these substances. In addition, there may be times when the blood bank needs to irradiate blood products for transfusion. This may occur when patients need blood in which the white blood cells have been deactivated.

Blood banks undergo additional regulation by the **Food and Drug Administration (FDA)** and the *American Association of Blood Banks (AABB)*. The FDA approves medical and diagnostic equipment, pharmaceuticals, reagents (chemicals used for testing), and diagnostic tests before these can be marketed. The FDA also regulates collection, processing, and content-labeling requirements through the current Good Manufacturing Process (cGMP) regulations. Blood and blood products are considered pharmaceuticals. The AABB is an international, not-for-profit association that develops standards and educational programs that focus on blood donor and recipient safety. The AABB also specifically accredits blood banks.

Other organizations that inspect or accredit medical laboratories include state and local agencies and the American Society for Histocompatibility and Immunogenetics (ASHI). Regulatory agencies provide a valuable service to ensure patient safety through regular inspections. The inspection process is designed to assess compliance with regulations and evaluate a laboratory's policies, procedures, and practices. Table 1-4 summarizes regulatory agencies and their relevance to the phlebotomist.

Checkpoint Questions 1.6

1. Which regulatory agency is *most* concerned with the quality of laboratory tests performed in physician offices?
2. What is the purpose of CLIA '88?

TABLE 1-4 Regulatory Agencies and the Phlebotomist

Agency	Acronym	Relevance to the Phlebotomist
American Association of Blood Banks	AABB	Accredits blood banks and develops standards for blood donor, blood product, and blood recipient safety
American Society for Histocompatibility and Immunogenetics	ASHI	Inspects and accredits laboratories that perform histocompatibility testing
Centers for Disease Control and Prevention	CDC	Categorizes newly developed laboratory tests
Centers for Medicare & Medicaid Services	CMS	The agency that established regulations to implement CLIA '88
Clinical and Laboratory Standards Institute	CLSI	Sets standards for clinical laboratory testing procedures
College of American Pathologists	CAP	Accredits hospital and reference laboratories
Commission on Office Laboratory Accreditation	COLA	Accredits physician office laboratories
Department of Health and Human Services	HHS	Oversees the operations of the CMS
Department of Transportation	DOT	Sets requirements for safe packaging and transport of HAZMATs
Environmental Protection Agency	EPA	Ensures correct disposal of medical waste
Food and Drug Administration	FDA	Approves medical equipment, pharmaceuticals, reagents, and diagnostic tests before use—laboratory-issued pharmaceuticals include blood products
National Accrediting Agency for Clinical Laboratory Sciences	NAACLS	Approves phlebotomy training programs
Nuclear Regulatory Commission	NRC	Regulates handling and disposal of radioactive materials
Occupational Safety and Health Administration	OSHA	Regulates practices to ensure worker safety in the workplace
The Joint Commission	TJC (formerly JCAHO)	Accredits healthcare facilities to ensure high standards of patient care

1.7 Qualities of a Phlebotomist

A practicing phlebotomist must be professional and display professionalism at all times. A phlebotomist's public image, along with excellent communication and customer service skills, is a necessary quality of this occupation.

Professionalism

Most people do not like having their blood drawn because of the potential discomfort, so **professionalism** and good interpersonal skills are critical attributes. Professionalism includes a sincere interest in providing healthcare, a standard of excellence, training, accountability, and pride in your work. Having a well-groomed and professional appearance demonstrates to others a sense of pride in yourself, your workplace, and your overall profession.

Becoming certified or licensed as a phlebotomist can also send an important message to the patient, and, in turn, the patient will have more confidence in your abilities. Professionalism is covered in more detail in the chapter *Practicing Professional Behavior*.

Public Image

First impressions are key. Your appearance is the first statement you send to those around you. Phlebotomists are expected to be clean, well-groomed, and

Providing Customer Service

Think It Through

Your patients are your customers, so they should be satisfied with your service. Customer service involves providing customer satisfaction through professionalism, positive communication, and an attitude that promotes resolution of problems. Good customer service is an essential part of phlebotomy practice.

Example scenario: You are working alone in a busy laboratory because two other phlebotomists have called in sick. The laboratory waiting area is crowded. You expect another phlebotomist to arrive in about 20 minutes. What could you do to promote positive customer service?

appropriately dressed for the work setting (this includes closed-toe and closed-heel shoes and socks; no high heels). Basic details are mandatory such as using good posture; being well rested; and having fresh breath, no unpleasant body odor, clean hair that does not cover the face (tied back if hair is long), minimal to no facial hair, no facial or tongue piercings, and no visible tattoos. Lack of good personal hygiene or proper dress can give a negative impression to an already anxious patient.

Many institutions require that phlebotomists wear a lab jacket and specified shoes in order to meet Occupational Safety and Health Administration (OSHA) guidelines. Compliance with the dress code established by your facility is important for establishing a professional public image. Depending on the setting, the phlebotomist may be the only laboratory contact person a patient encounters, so a positive public image is important not only for the credibility of the individual but also for the laboratory department and institution.

Customer Service and Communication

The healthcare industry is service oriented. This means that, as a healthcare professional, you want your customers (patients) to be pleased with both the services you provide and the manner in which you deliver them. This is customer service. Positive communication is key to customer service.

The process of communication occurs in a loop (see Figure 1-16). The *communication loop* involves four basic elements: (1) the sender, (2) the message, (3) the receiver, and (4) feedback. The sender is the one who begins the communication process by encoding a message to be sent. The message is the thought, idea, or information. The receiver is the person who decodes the meaning of the message. Feedback is the receiver's acknowledgment of and response to the message. If clarification is needed, a role reversal occurs. The receiver now becomes the sender and encodes a message to be sent. Filters or barriers—pain, fear, visitors, or the television—may be present and can interfere with a receiver decoding a message. For the communication loop to occur, the sender and receiver will alternate roles.

The ability to communicate and provide customer service is crucial for the phlebotomist. Communication can be verbal or nonverbal. *Verbal* refers to the use of language or words to express ideas. The phlebotomist must be able to communicate using nonmedical terms, so that patients can understand what is being said to them. For example, using the term *venipuncture* with a patient

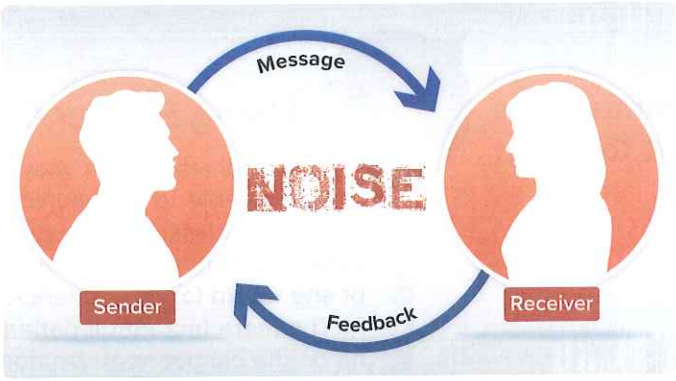


Figure 1-16 The process of communication involves an exchange of message and feedback. Noise (barriers to communication) can interfere with the communication process.

TABLE 1-5 Nonverbal Communication: Positive Versus Negative Gestures

Positive	Negative
• Good body posture	• Drooping shoulders with head held low
• Eye contact	• Looking down or away from patient
• Neat, well-groomed appearance	• Dingy, wrinkled lab coat; too much jewelry
• Respect of personal space	• Immediate approach of patient's space before greeting and explaining procedures

instead of simply telling the patient that you will be "drawing some blood" can create a block in communication. The phlebotomist must be capable of explaining procedures to patients of various ages in order to gain their confidence and cooperation.

Never give false reassurance to patients by making statements such as "You won't even feel it" because most patients feel some level of discomfort during phlebotomy procedures. Avoid using slang, or "street" talk, because different words have different meanings to different individuals. Address patients by name, avoiding inappropriate terms such as "honey" or "sweetie." Excessive talking is also to be avoided because it tends to be annoying to patients wanting and needing rest. Speak in a calm and clear voice with a tone appropriate to the patient's needs. For example, you may need to use a louder volume for a patient who has hearing loss.

Patients receive not only the spoken message but also the nonverbal cues the phlebotomist sends (see Table 1-5). Nonverbal communication begins with attire and includes overall mannerisms and behaviors. Maintaining eye contact during patient interactions is a positive nonverbal response that assists with establishing trust. During the initial greeting, displaying a smile, maintaining erect body posture with relaxed arms, and avoiding the patient's personal space are usually well-received gestures. Personal space is the proximity or distance between individuals a person prefers when interacting with others. Many people feel uncomfortable when strangers approach them and immediately enter their personal space. Appropriate distance for personal space or proximity varies based on gender, culture, and personal preference.

Nonverbal behavior also includes the use of communication devices such as cell phones and Bluetooth technology. Using these while on the job not only causes a distraction from job duties but is also rude to your patient. Remember, the patient is your customer who can choose to seek healthcare services at another facility. Many facilities have policies restricting the use of cell phones due to possible electromagnetic interference with medical devices.

Communicate & Connect

Using Proper Communication

The phlebotomist may be required to obtain blood from patients who are unable to communicate as a result of a stroke or other medical condition. Regardless of the patient's inability to communicate, the phlebotomist is expected to provide the same greetings, introductions, and explanations as he or she would for any patient.

The mere fact that a patient cannot respond does not necessarily mean that he or she cannot hear! Do not talk in the presence of unconscious patients as if they cannot hear you.

To provide positive communication and customer service when approaching any patient, the phlebotomist should properly introduce themselves, state the purpose of the visit, and request that the patient state and spell their full name and date of birth if capable. The patient should respond verbally to the request and if they are unable to do so another means of identification should be used. Once an initial greeting is established, it is acceptable and necessary to move closer to the patient's bedside or chair, depending on the workplace setting. You can ensure positive patient experiences by being attentive to their concerns or anxieties starting with observing their behavior, listening to their concerns, and addressing any situation promptly and effectively. You should approach any problem with flexibility and the obligation to find a resolution. Learn How 1-1 provides general steps for providing good customer service through communication.

Learn How 1-1

Communication and Customer Service
1. Ensure that you are neat and well-groomed before approaching a patient.
2. Approach the patient with an upright and open posture and a smile.
3. Address the patient with respect using the patient's name and verify their identity by asking the date of birth.
4. Maintain eye contact with the patient during your introduction.
5. Respectfully request to draw the blood.
6. Do not enter the patient's personal space to draw the blood until you have verbal or nonverbal approval.
7. Thank the patient for their cooperation when you have finished the procedure.

Checkpoint Questions 1.7

1. Name four examples of positive nonverbal communication.
2. What is customer service?

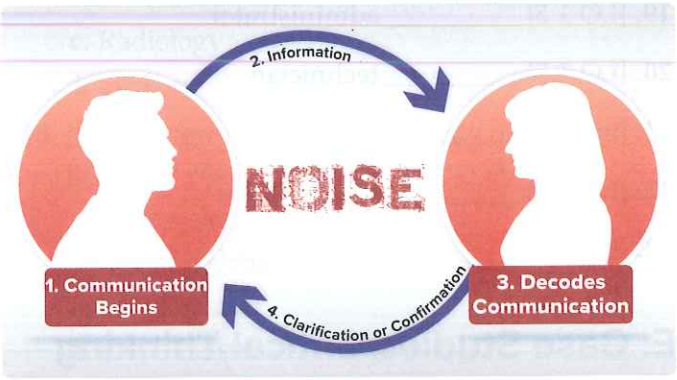
Chapter Summary

Learning Outcome	Key Concepts/Examples	Related NAACLS Competency
1.1 Summarize the definition and history of phlebotomy.	Phlebotomy means cutting into a vein. It is an invasive procedure performed by phlebotomists; it has evolved from the use of leeches for blood collection to modern-day certified phlebotomists.	1.1
1.2 Explain the role of the phlebotomist in the various healthcare facilities where they may be employed.	Phlebotomists are responsible for the collection, processing, and transportation of blood specimens, as well as other duties required by their place of employment.	1.2, 7.3
1.3 Describe inpatient and outpatient healthcare facilities and their relationship to the practice of phlebotomy.	Phlebotomists can be employed at hospitals, rehabilitation centers, nursing homes, clinics, physician offices, ambulatory care centers, blood banks, reference laboratories, and insurance companies.	1.3
1.4 Identify the healthcare providers and other members of the healthcare team with which the phlebotomist will interact in inpatient and outpatient facilities.	Phlebotomists interact with healthcare professionals from many medical specialties including nurses, physicians, radiologic technologists, respiratory therapists, physical therapists, and surgical technicians.	1.2
1.5 Outline the organization of the medical laboratory.	Medical laboratories are organized based on the needs of the facility in which they serve. Phlebotomists interact with medical laboratory personnel from many laboratory specialties, including clinical chemistry, cytology, hematology, histology, immunohematology, immunology, medical microbiology, molecular diagnostics, and urinalysis.	1.4, 1.5, 1.6
1.6 Recognize the agencies that regulate hospitals and medical laboratories.	The regulating agencies for the practice of phlebotomy include CLSI, TJC, CMS, HHS, CDC, and OSHA.	1.1
1.7 List the qualities and characteristics of a phlebotomist.	Proper professionalism, public image, communication, and customer service are necessary traits of a phlebotomist.	9.1, 9.4, and 9.7

Chapter Review

A: Labeling

Label the elements of this communication cycle. Write the name of each element on the lines provided.



1. [LO 1.7] _____

2. [LO 1.7] _____

3. [LO 1.7] _____

4. [LO 1.7] _____

B: Matching

Match each organization with its role in regulating medical laboratories.

____5. [LO 1.6] sets standards for laboratory testing

____6. [LO 1.6] is responsible for minimizing work-related injuries

____7. [LO 1.6] regulates content labeling of blood products

____8. [LO 1.6] regulates the internal handling of medical waste

____9. [LO 1.6] monitors and reports diseases

___10. [LO 1.6] sets standards for phlebotomy training programs

a. AABB
b. CAP
c. CDC
d. CLSI
e. EPA
f. FDA
g. NAACLS
h. OSHA

C: Fill in the Blank

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

11. [LO 1.2] The healthcare professional who has the greatest control over pre-examination variables during blood collection is the _____.

12. [LO 1.5] The medical doctor who works in the laboratory is the _____.

13. [LO 1.7] Becoming _____ or licensed as a phlebotomist sends a positive message to patients.

14. [LO 1.3] The term used to describe tests that are performed at a patient's bedside is _____.

List two negative verbal and two negative nonverbal types of communication that should be avoided.

Verbal

15. [LO 1.7] _____

16. [LO 1.7] _____

Nonverbal

17. [LO 1.7] _____

18. [LO 1.7] _____

D: Sequencing

Place the laboratory personnel in the order of hierarchy in a laboratory's organizational chart (from 1 [highest management function] to 5 [lowest management function]).

19. [LO 1.5] _____ administrator

20. [LO 1.5] _____ technician

21. [LO 1.5] _____ scientist

22. [LO 1.5] _____ phlebotomist

23. [LO 1.5] _____ section supervisor

E: Case Studies/Critical Thinking

24. [LO 1.7] A patient is having blood work done during her lunch hour. She has waited 25 minutes before being called back for her blood to be drawn. How can you implement customer service in this situation?

25. [LO 1.7] A phlebotomist has been asked to obtain a blood specimen from a hospitalized patient. The phlebotomist enters the patient's room and gives the appropriate greeting but discovers that the patient speaks only Spanish, a language the phlebotomist is unfamiliar with. Should the phlebotomist proceed with the blood collection? What are the phlebotomist's next steps? Explain your answer.

26. [LO 1.7] The phlebotomist is scheduled to obtain a blood specimen from a patient in a patient's home. The phlebotomist enters the home and makes the appropriate greetings. The patient is very agitated and states, "I'm just sick and tired of you people drawing my blood. It's not helping me to get any better, so get out! I refuse to be a pincushion for you medical jerks!" What would be a good response for the phlebotomist to make? How should the phlebotomist handle this situation?

F: Exam Prep

Choose the best answer for each question.

27. [LO 1.1] The term *phlebotomy* comes from Greek words that mean

a. "draw blood."
b. "cut vein."
c. "drain blood."
d. "dermal cut."

28. [LO 1.2] The minimum requirements for entry into a phlebotomy training program generally include a

a. nursing degree or CNA certification.
b. medical laboratory MLT certification.
c. high school diploma or equivalent.
d. medical assisting certification.

29. [LO 1.2] The main duty of a phlebotomist is to

a. interpret laboratory values.
b. evaluate blood specimens.
c. process blood specimens.
d. collect blood specimens.

30. [LO 1.2] The phlebotomist is mainly responsible for which phase of laboratory testing?

a. Examination
b. Preexamination
c. Post-examination
d. Reporting

31. [LO 1.2] Which of the following is *not* a phlebotomist's duty?

a. Aseptic procedures
b. Dermal/Capillary puncture
c. Surgery assistance
d. Venipuncture

32. [LO 1.3] Which of the following is the fastest-growing type of facility that provides job opportunities for phlebotomists?

a. Physician offices
b. Home healthcare
c. Insurance companies
d. Ambulatory care centers

33. [LO 1.4] The diagnosis and treatment of conditions pertaining to the heart and circulatory system are the functions of which medical specialty?

a. Anesthesiology
b. Cardiology
c. Respiratory therapy
d. Electroencephalography

34. [LO 1.4] The assessment and treatment of breathing disorders are the functions of which medical specialty?

a. Diagnostic imaging
b. Endocrinology
c. Physical therapy
d. Respiratory care

35. [LO 1.4] Restoration of maximum movement and functional ability is the purpose of

a. occupational therapy.
b. orthopedics.
c. physical therapy.
d. respiratory therapy.

36. [LO 1.7] Which specialty uses ionizing radiation to produce diagnostic images?

a. Nuclear medicine
b. Orthopedics
c. Pathology
d. Surgery

37. [LO 1.4] Which specialty recommends treatment plans based on therapeutic drug monitoring results from the laboratory?

a. Nuclear medicine
b. Pharmacy
c. Radiology
d. Surgery

38. [LO 1.5] Surgically removed body tissues are prepared and stained by

a. cytologists.
b. hematologists.
c. histologists.
d. tissuologists.

39. [LO 1.5] Prepared body tissues are examined and a diagnosis is made by

a. cytologists.
b. histologists.
c. pathologists.
d. tissuologists.

40. [LO 1.5] Cross-matching of donated blood with a recipient is the function of

a. cytology.
b. histology.
c. immunohematology.
d. immunology.

41. [LO 1.5] The study of the body's resistance to disease is the function of

a. clinical chemistry.
b. histology.
c. immunology.
d. microbiology.

42. [LO 1.6] CLIA classifies laboratories based on

a. number of employees.
b. size of the laboratory.
c. number of tests performed.
d. complexity of tests performed.

43. [LO 1.6] A college dean who wants to offer a phlebotomy training program would seek approval from which organization that sets standards for phlebotomy training programs?

a. CAP
b. CLSI
c. NAACLS
d. OSHA

44. [LO 1.7] Barriers that can interfere with clear communication include all of these *except*

a. eye contact.
b. fear and anxiety.
c. pain or discomfort.
d. television viewing.

45. [LO 1.7] Customer service would *least* likely include

a. common courtesy.
b. complexity.
c. flexibility.
d. professionalism.

46. [LO 1.7] Evaluate which of the following scenarios would *best* contribute to customer satisfaction.

a. A medical office receptionist tells a patient to "have a seat" without making eye contact.
b. A phlebotomist fumbles with equipment assembly prior to the blood collection procedure.
c. A healthcare worker encounters a lost visitor and assists this person to his destination.
d. A medical assistant is always dressed in the latest fashions and jewelry.

47. [LO 1.2] In some facilities, phlebotomists are trained as patient care technicians with duties that include which of the following? (*Choose all that apply.*)

a. Basic first aid
b. CPR
c. ECG
d. Patient transport

48. [LO 1.2] Which of the following would least likely be the role of a phlebotomist?

a. assisting other healthcare professionals with specimen collection.
b. interpretation of provider orders for laboratory testing.
c. performing high complexity laboratory tests.
d. providing laboratory test results to ordering provider.

49. [LO 1.2] A phlebotomist may perform which level of testing? (*Choose all that apply.*)

a. Waived Testing
b. Moderate Complexity Testing
c. High Complexity Testing

50. [LO 1.2] A phlebotomist's role may include which of the following? (*Choose all that apply.*)

a. blood donor collection (with additional training).
b. instructing patients on non-blood specimen collection.
c. packaging specimens for transport.
d. delivering specimens to appropriate laboratory sections.

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essential terms