

Understanding the Clinical Laboratory

Welcome to Understanding the Clinical Laboratory for [Company Name] Field Service Engineers (FSEs). After completing this training, you will be able to:

- Understand the relationship between the clinical laboratory and the physician.
- Identify who works in the clinical laboratory.
- Describe each department of the clinical laboratory.
- Comprehend specimen collection and handling.
- Be aware of laboratory certifications and regulations
- Look to the future laboratory.

Clinical Laboratory Overview

Clinical laboratory science is crucial to the practice of modern medicine. Data from clinical laboratories is used by:

- Physicians to make accurate diagnoses.
- Nurses, pharmacists, and other health professionals to plan or implement patient treatment and care.

Did you know...

Billions of dollars are spent each year on tests performed in clinical laboratories, with volumes expected to increase annually. Advances in medical laboratory procedures enable physicians to make earlier, more definitive diagnoses and to tailor therapy for patients.

The clinical laboratory typically includes the chemistry, hematology, microbiology, blood banking, and special chemistry departments. Each department may be further divided into specialty areas, such as immunology, toxicology, and hemostasis.

Types of Clinical Laboratories

There are several types of clinical laboratories:

- **Hospital laboratories** serve the needs of the hospital, and provide testing services requested by the medical staff for their inpatients and outpatients.
- **Reference laboratories** are usually large, commercial laboratories with locations throughout the country that perform both routine and specialized laboratory tests. Reference labs often have small, satellite labs serving several communities that collect specimens to be sent to the larger “parent” laboratory for testing.

- **Physician's office laboratories** are often owned by a group of physicians and perform routine laboratory tests on their patients. Non-routine tests are usually sent to a reference laboratory.

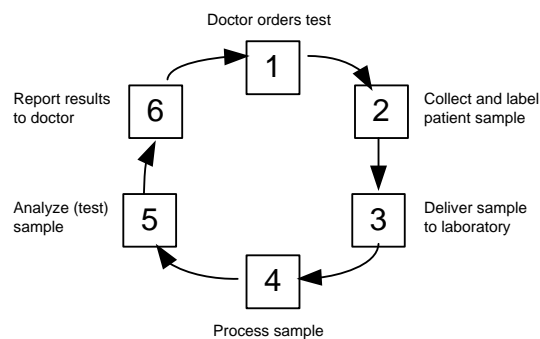
Did you know...

Hospital and physicians office laboratories perform 75% of all analyses. The remaining 25% are performed by independent reference laboratories.

Laboratory Workflow

The clinical lab's role is to collect specimens, perform tests, and report the results. A typical workflow includes the cycle shown.

Specimen Flow for Laboratory Testing



Who Works in the Laboratory

You'll find the following levels of certified personnel in a clinical laboratory, depending on the size of the laboratory and scope of services provided:

Medical technologist (MT) or clinical laboratory scientist (CLS).

Medical laboratory technician (MLT) or clinical laboratory technician (CLT).

Technical and/or general supervisor, such as a medical doctor or Ph.D. with certification in anatomic and/or clinical pathology or other specialty. The general supervisor may also be an MT, CLS, MLT, or CLT.

Laboratory medical director, such as a pathologist or clinical scientist.

Note: Within the laboratory's organizational structure, the actual position titles may be different.

Medical Director

Laboratory certifying agencies require that the director of a certified lab must be either of the following:

- Physician (M.D. or D.O.), such as a pathologist
- Ph.D., such as a clinical scientist

Most hospital and reference laboratories are directed by [pathologists](#), who specialize in identifying the nature and cause of disease and are trained to interpret patient specimens.

Pathologist

The pathologist is a physician who diagnoses the cause and nature of a disease. A pathologist has received a doctorate of medicine (M.D. or D.O.) and has completed a five-year residency in both clinical and anatomic pathology. Many diagnoses are formulated by reviewing the results of both the clinical lab test result and the anatomic pathology result.

- **Clinical pathology** encompasses the disciplines of hematology, chemical pathology, microbiology, immunology, and blood banking. The clinical pathologist consults with the patient's primary care physician regarding laboratory test results.
- **Anatomic pathology** involves the definitive diagnosis of disease processes based on tissue samples, such as surgical specimens, body fluids, and bone marrow.

A pathologist who passes the American Board of Pathology (ABP) certification exam is called a board-certified pathologist.

Pathologist's Responsibilities

As the laboratory medical director, the pathologist's responsibilities include:

- Overseeing [quality control](#) and [proficiency testing](#) of the laboratory services.
- Providing laboratory consultations and test interpretations to medical clinicians.
- Evaluating and providing clinical input to the laboratory management staff regarding equipment purchases and new test methodologies.
- Providing ongoing education for the laboratory, nursing, and medical staff regarding laboratory medicine.
- Participating in the preparation of the annual capital and operations budget of the laboratory.
- Serving as the primary representative and liaison of the laboratory to the medical staff.

Technical and/or General Supervisor

In addition to the lab director, many clinical laboratories also employ technical or general supervisors.

Technical supervisors are responsible for the technical and scientific oversight of the lab and must be either of the following:

- Physician (M.D. or D.O.), such as a pathologist
- Ph.D., such as a clinical scientist

General supervisors may have the same qualifications as the technical supervisor, but hold a bachelor's or associate's degree in the sciences, or possess appropriate experience. A general supervisor is responsible for oversight of the personnel conducting and reporting the tests as well as the daily lab operations.

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