

# CALIFORNIA

## OCCUPATIONAL GUIDES

### MEDICAL AND CLINICAL LABORATORY TECHNOLOGISTS

CALIFORNIA OCCUPATIONAL GUIDE - NUMBER 17  
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INTEREST AREA  
INVESTIGATIVE



### WHAT DOES A MEDICAL AND CLINICAL LABORATORY TECHNOLOGIST DO?

Physicians order medical tests when a disease or disorder is suspected to be the cause of illness. Most testing is done in a modern clinical laboratory using automated testing equipment that can do many of the more routine tests, such as a breakdown of the components of the blood. However, when human judgment is needed clinical laboratory personnel become involved. **MEDICAL AND CLINICAL LABORATORY TECHNOLOGISTS** perform and analyze complex chemical, biological, hematological, immunologic, microscopic, and bacteriological medical tests.

Medical and Clinical Laboratory Technologists perform the following tasks:

- Perform laboratory tests on the blood, tissues, and fluids from the human

body to reveal facts about a patient's condition that cannot be determined by direct examination.

- Examine and analyze body fluids, tissues, and cells for bacteria, parasites, or other microorganisms; analyze the chemical content of fluids; match blood for transfusions, and test for drug levels in the blood to show how a patient is responding to treatment.
- Prepare specimens for examination, count cells, and look for abnormal cells.
- Use automated equipment and instruments to perform tests, including microscopes, cell counters, and other kinds of sophisticated laboratory equipment. They analyze the results and relay them to physicians.
- May supervise lab technicians and assistants.
- Set up, adjust, and check the performance of automated lab equipment.

Entry-level Technologists generally perform a variety of routine tests under close supervision. Experienced Technologists handle more specialized or unusual procedures. They may also help to develop, standardize, and evaluate new techniques.

### WHAT SKILLS ARE IMPORTANT?

Important skills, knowledge, and abilities for Medical and Clinical Laboratory Technologists include:

- Science – Using scientific rules and methods to solve problems.
- Information Ordering – The ability to arrange things or actions in a certain order or pattern according to a specific rule or set of rules (e.g., patterns of numbers, letters, words, pictures, mathematical operations).
- Operation and Control – Controlling operations of equipment or systems.

- Mathematics – Using mathematics to solve problems.
- Written and Oral Expression and Comprehension – The ability to read, understand and communicate information and ideas in writing so others will understand.
- Biology – Knowledge of plant and animal organisms, their tissues, cells, functions, interdependencies, and interactions with each other and the environment.
- Chemistry – Knowledge of the chemical composition, structure, and properties of substances and of the chemical processes and transformations that they undergo. This includes uses of chemicals and their interactions, danger signs, production techniques, and disposal methods.
- English Language – Knowledge of the structure and content of the English language including the meaning and spelling of words, rules of composition, and grammar.

### WHAT'S THE WORK ENVIRONMENT?

Working conditions vary according to the size and type of employment setting. Clinical laboratory personnel are trained to work with infectious specimens. When proper methods of infection control and sterilization are followed, few hazards exist. Laboratories generally are well lighted and clean; however, specimens, solutions, and reagents used in the laboratory to detect or measure substances sometimes produce odors. Laboratory workers may spend a great deal of time standing.

Many Technologists belong to the California Association for Medical Laboratory Technology (CAMLT), the American Society for Clinical Pathology (ASCP), the American Society for Clinical Laboratory Science (ASCLS) and other national societies with interests in a particular area of the laboratory (American Association of Clinical Chemists, American Association of Blood Banks, American Society for Microbiology, etc.).

#### **Union Membership**

Some Technologists belong to unions, such as the Engineers and Scientists of California, or the Office and Professional Employees' International Union.

### WHAT'S THE JOB OUTLOOK?

The following information is from the occupational projections produced by the Employment Development Department (EDD) Labor Market Information Division (LMID):

Estimated number of workers in 2000:	12,500
Estimated number of workers in 2010:	15,800
Projected Growth 2000-2010:	26.4%
Est. openings due to separations by 2010:	3,300

*These figures do not include self-employment.*

Medical and Clinical Laboratory Technologists will grow faster than average compared with all occupations in California.

About 21,000 Medical Technologists hold active California licenses; not all licensees, however, are working as Technologists.

Since the mid-1980s, slightly fewer people appear to seek training or jobs in this field. Initial fears of the hazard of infection from handling potentially AIDS contaminated blood has contributed to some reluctance to enter or even remain in this occupation.

#### **Trends**

Employers in some areas report difficulty finding experienced Technologists, and some difficulty recruiting trained, but inexperienced applicants. An aging population, typically the age group that requires the greatest level of medical care, will boost demand for laboratory testing.

New automated lab testing equipment will allow Technologists to increase productivity, but the development of more complex molecular and genetic tests will likely counter any reduction in lab test volume.

Hospital mergers and an increased emphasis on cost control have led to a need for increased productivity and decreased testing turnaround. One change that is occurring in medical facilities is "point-of-care testing" – lab tests that are not done in the traditional laboratory but in satellite labs or by hand-held analyzers at bedside.

**WHAT DOES THE JOB PAY?**

**California Earnings**

Medical and Clinical Laboratory Technologists  
2002 Wages

Hourly wages range from	\$23.12	to	\$30.85
Average hourly wage	\$26.78		
Average annual wage	\$55,700		

Source: *Occupational Employment Survey of Employers* by EDD/LMID.

**Hours**

In large hospitals or in independent laboratories that operate continuously, personnel usually work the day, evening, or night shift, and may work weekends and holidays. Laboratory personnel in small facilities may work rotating shifts rather than a regular shift. In some facilities, laboratory personnel are on call (available in case of emergency) several nights a week or on weekends.

Full-time Technologists work eight hours a day, five days a week. Technologists who work evenings, night shifts, overtime, or “stand-by” usually receive extra pay. The most common hours are from 7 a.m. to 3 p.m. for days, 3 p.m. to 11 p.m. for the swing shift, and from 11 p.m. to 7 a.m. for the night shift.

**Benefits**

Most employers provide vacation, sick leave, partial to full retirement plans, and medical, dental, and vision insurance.

**HOW DO I PREPARE FOR THE JOB?**

**Education and Training**

Several colleges and universities in California offer programs leading to a Bachelor’s of Science (B.S.) degree in medical technology or clinical laboratory science. Contact the California Association for Medical Laboratory Technology for information about active training programs for Medical and Clinical Laboratory Technologists.

Community college students who plan to transfer to a four-year degree program in medical

technology should obtain an associate degree in natural sciences. High school students should take biology, chemistry, and mathematics as preparation toward this career.

**Licensing and Certification**

California is one of a handful of states that requires Medical and Clinical Laboratory Technologists to be licensed. They are licensed by the Department of Health Services after passing an examination that requires the following:

- A Bachelor’s of Science degree from an accredited institution in clinical laboratory science that includes one year of approved training in a clinical laboratory.  
or
- A Bachelor’s of Science degree from an accredited institution with a major closely related to clinical laboratory science, plus a one-year internship as a Clinical Laboratory Technologist Trainee in an approved clinical laboratory. The degree must include the following units:
  - Chemistry (including analytical and biological chemistry): 16 semester, or equivalent quarterly units.
  - Biological science (including immunology, hematology and medical biology): 18 semester, or equivalent quarterly units.
  - Physics (including principles of light and electricity): 3 semester, or equivalent quarterly units.
 or
- A Bachelor’s degree and equivalent experience and training in the clinical laboratories used by the armed forces.

The requirements to become a Licensed Clinical Laboratory Technologist Trainee are:

- Graduate with a B.S. degree from a college or university with a major in clinical laboratory science or a closely related field.  
or
- Complete 90 semester or equivalent quarter units that include all of the units in chemistry,

biological science, and physics courses described above, *and* be eligible for a B.S. degree at the completion of 12 months of training.

**Continuing Education**

Twelve hours per year of continuing education are required to renew the annual license.

**HOW DO I FIND THE JOB?**

Technologist trainees are usually hired by laboratories where they work as interns. Therefore, an internship is a vital step in a Technologist’s career. The California Association for Medical Laboratory Technology often lists openings for employers who are recruiting. Job seekers should also check classified ads in newspapers and medical lab journals, network with other Technologists and former instructors, and apply directly with medical labs and health service centers. Hospitals and reference lab Web sites are also good places to find current postings.

Direct application to employers remains one of the most effective job search methods. Private firms are listed in the yellow pages under laboratories, medical and hospitals. California job openings can be found at various online job-listing systems including CalJOBS<sup>SM</sup> at [www.caljobs.ca.gov](http://www.caljobs.ca.gov) or at America’s Job Bank at [www.ajb.dni.us](http://www.ajb.dni.us).

For other occupational and wage information and a listing of the largest employers in any county, visit the Employment Development Department Labor Market Information Web page at [www.calmis.ca.gov](http://www.calmis.ca.gov). Find further job search assistance from your nearest Job Service office [www.edd.ca.gov/jsloc.htm](http://www.edd.ca.gov/jsloc.htm) or the closest One-Stop site listed on the California WorkNet site, [www.sjtcc.ca.gov/sjtccweb/one-stop](http://www.sjtcc.ca.gov/sjtccweb/one-stop).

**WHERE CAN THIS JOB LEAD?**

Technologists may become “working” supervisors, who coordinate and perform the work of a single unit or shift. Some Technologists advance to administrators who plan and oversee all laboratory operations. Those with at least four years of varied experience and advanced education may qualify for the Clinical Laboratory Bioanalyst license, which allows them to direct an independent laboratory.

Some Technologists go into related fields of work, such as medical or drug research, public health, nuclear medical technology, clinical lab science education, or technical equipment sales.

**OTHER SOURCES OF INFORMATION**

Department of Health Services  
 Laboratory Field Services Section  
 Northern California Office  
 1111 Broadway 19<sup>th</sup> Floor  
 Oakland, CA 94607  
 (510) 873-6328  
 Southern California Office  
 865 Figueroa Street, Suite 360  
 Los Angeles, CA 90017  
 (213) 833-6000  
[www.dhs.cahwnet.gov/ps/lsl/lfsb/lfsbindex.htm](http://www.dhs.cahwnet.gov/ps/lsl/lfsb/lfsbindex.htm)

California Association for Medical  
 Laboratory Technology  
 Executive Office  
 1895 Mowry Ave, Suite 112  
 Fremont, CA 94538  
 (510) 792-4441  
[www.camlt.org](http://www.camlt.org)

The American Society for Clinical  
 Pathology (ASCP)  
 2100 West Harrison Street  
 Chicago, IL 60612  
 (312) 738-1336  
[www.ascp.org](http://www.ascp.org)

Employment Projections by Occupation  
[www.calmis.ca.gov/htmlfile/subject/occproj.htm](http://www.calmis.ca.gov/htmlfile/subject/occproj.htm)

Employment and Wages by Occupation  
[www.calmis.ca.gov/file/occup\\$/OES\\$.htm](http://www.calmis.ca.gov/file/occup$/OES$.htm)

**RELATED OCCUPATIONAL GUIDES**

- Microbiologists No. 168
- Laboratory Assistants and Technicians (Except Health) No. 201

**OCCUPATIONAL CODE REFERENCES**

**SOC** (*Standard Occupational Classification*)  
 Medical and Clinical Laboratory Technologists 29-2011

**O\*NET** (*Occupational Information Network*)

Medical and Clinical Laboratory Technologists 29-2011.00

**OES** (*Occupational Employment Statistics*)

Medical, Clinical Laboratory Technologists 32902

**DOT** (*Dictionary of Occupational Titles*)

Biochemistry Technologist 078.261-010  
Microbiology Technologist 078.261-014  
Histotechnologist 078.261-030  
Medical Technologist 078.261-038  
Cytotechnologist 078.281-010