

# 2016 APHL™ ANNUAL MEETING

and tenth government environmental laboratory conference

## Laboratory Competency Analysis Tool - LCAT

APHL Emerging Leaders  
Program Cohort 8



# Emerging Leader Program

- 12-month leadership development program for public health laboratorians
- Three skill-building workshops
- Group Project: Yearlong project to identify an innovative solution to a problem in the public health laboratory community

# Cohort 8

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# Development of the LCAT

Centers for Disease Control and Prevention  
**MMWR**

Morbidity and Mortality Weekly Report

Supplement / Vol. 64 / No. 1

May 15, 2015

## Competency Guidelines for Public Health Laboratory Professionals

CDC and the Association of Public Health Laboratories



U.S. Department of Health and Human Services  
Centers for Disease Control and Prevention

“THESE GUIDELINES PROVIDE HIGHLY STRUCTURED COMPETENCIES INTENDED TO HELP ENSURE A CAPABLE, WELL-TRAINED, AND PREPARED LABORATORY WORKFORCE.”

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## General Laboratory Practice Competency Guidelines

**Purpose statement:** The competencies in General Laboratory Practice address the knowledge, skills, and abilities needed to fulfill basic responsibilities for performing sample analyses within a public health laboratory setting (Table 8).

**Introduction:** General laboratory practice is the set of foundational knowledge and capabilities needed for the testing of samples across the wide spectrum of scientific and technical activities of public health laboratories. As these practices can be applied in many areas of analysis, they have been consolidated into this domain to minimize, but not eliminate, repetition across the specialized domains and to create a domain that covers testing not specifically encompassed by the Chemistry or Microbiology domains.

These broad practices are central to the performance of laboratory testing. Laboratory scientists, regardless of their specific area of scientific or technical expertise, rely on these skills to accomplish the array of testing in public health laboratories.

**Notes:** Sources were identified as support documents for this domain (59,60), which is intended for both general and specialized laboratory scientists. This domain is meant to be used in conjunction with specialized domains such as Microbiology, Chemistry, and Research since it includes technical practices not addressed in those domains. The verb “oversees” is used extensively in the Expert level. In this context, “oversees” is a broad term that comprises the many functions related to the management of policies, processes and procedures to include creation, design, development, directing, monitoring, evaluation, and collaboration.

TABLE 8. Public health laboratory competency guidelines: General Laboratory Practice domain

GEN 1.00. General technical and laboratory practice knowledge: demonstrates general knowledge and skills related to the scientific and technical components of laboratory testing

Subcompetency	Beginner	Competent	Proficient	Expert
GEN 1.01. General scientific and laboratory concepts and theories	Applies basic scientific and laboratory concepts and theories* related to the specific testing that is conducted in work area	Instructs others in concepts and theories related to the specific testing that is conducted in work area	Ensures that accepted concepts and theories are applied to laboratory testing	Oversees that laboratory practices are in accordance with accepted scientific and laboratory concepts and theories
GEN 1.02. Mathematical and statistical concepts and practices	Applies fundamental mathematical and statistical concepts and practices in work area	Instructs others in fundamental mathematical and statistical concepts and practices	Ensures appropriate utilization of mathematical and statistical concepts and practices	Oversees the policies* and procedures* regarding the use of mathematical and statistical concepts and practices
GEN 1.03. Scientific and technological advances	Reads scientific and technical literature relevant to own work	Discusses scientific and technical advances relevant to own work	Integrates scientific and technical advances into laboratory operations	Critiques scientific and technological advances to evaluate possible impact for the laboratory
GEN 1.04. Technical skills	Applies basic laboratory techniques to laboratory testing	Integrates basic laboratory techniques into standard operating procedures* and new laboratory practices	Ensures that staff are properly trained in the performance of technical skills	Oversees the application of technical skills to laboratory practices
GEN 1.05. Troubleshooting	Identifies routine problems related to technical duties and responsibilities	Resolves routine technical problems with methods, procedures, and laboratory equipment* including documenting corrective action	Resolves complex technical problems with methods, procedures, and laboratory equipment, including documenting corrective action	Oversees the policies, processes, and procedures related to troubleshooting technical problems
GEN 1.06. Model laboratory practices*	Applies knowledge of model laboratory practices	Instructs others in model laboratory practices	Implements model laboratory practices	Manages policies, processes, and procedures to ensure staff comply with model laboratory practices

See table footnotes on page 35.

## General Laboratory Practice Domain

- Selected based upon ability to cross section specialty areas
- A total of 7 areas; represented by 29 subcompetencies

# General Laboratory Practice

## Domain 1.00

General technical and laboratory practice knowledge: demonstrates general knowledge and skills related to the scientific and technical components of laboratory testing

**GEN 1.01** General scientific and laboratory concepts and theories

**GEN 1.02** Mathematical and statistical concepts and practices

**GEN 1.03** Scientific and technological advances

**GEN 1.04** Technical Skills

**GEN 1.05** Troubleshooting

**GEN 1.06** Model laboratory practices

**GEN 1.07** Documentation

**GEN 1.08** Stewardship of resources

**GEN 1.09** Scientific ethics

# **The Laboratory Competency Assessment Tool**

Development and Format of the  
Demo

# A brief introduction that supplies information to the survey taker



## Laboratory Competency Analysis Tool

[Survey Instructions](#)

[Email Support](#)

Hello,

Welcome to the Laboratory Competency Analysis Tool, or **LCAT**.

In May 2015, the Centers for Disease Control and Prevention (CDC) along with the Association of Public Health Laboratories (APHL) published in the [Morbidity and Mortality Weekly Report \(MMWR\) the Competency Guidelines for Public Health Laboratory Professionals \("Competency Guidelines"\)](#). The Competency Guidelines provide a standardized and comprehensive framework of key domains outlining the knowledge, skills and abilities of a competent laboratory workforce and can be used to assess individual performance.

The LCAT application is a tool to help laboratory professionals implement the Competency Guidelines. It enables managers and employees to assess competencies and identify where improvement is needed to progress to the next level.

Thank you for answering these questions in order to inform you about your competency level for General Laboratory Practices.

- Please answer all the questions with a Yes or No. You cannot skip a question. The questions are posed in groups of three and appear as you go.
- The survey consists of 9 sections with 12 questions in each section and is expected to take 15-20 minutes to complete.
- To move from screen to screen, please use the "Go Back" and "Next Page" buttons.
- The scoring process assumes that:
  - If a particular question does not apply to you, then you will respond with No.



## Laboratory Competency Analysis Tool

[Survey Instructions](#)

[Email Support](#)

### Demographics

First Name

Last Name

E-mail

Age

Do you supervise?

Years in position:

Discipline:

**Demographics are collected for a breakdown of how well the demo functions for various areas**

**The name entered into the survey will be utilized on the personalized results page upon survey conclusion**



Apply disinfectant specific to the testing conducted in work area.

Yes



No



Wear PPE when handling potentially infectious material.



Store chemicals in the work area according to compatibility.



Yes

No

Instruct others to use disinfectant specific to the testing conducted in work area.



Instruct others to wear PPE when handling potentially infectious material.



Instruct others to store chemicals in the work area according to compatibility.



Yes

No

Ensure disinfectants are specific to the testing conducted in work area.



Ensure PPE is worn when staff handle potentially infectious material.



Ensure chemicals are stored in the work area according to compatibility.



Yes

No

Oversee disinfectants used in the work area are specific to the testing.



Oversee PPE use when staff handle potentially infectious material.



Oversee the storage compatibility of chemicals in the work area.



Each subcompetency has a brief example list provided to assist in understanding the area being assessed

LCAT uses a yes/no question format

Questions sections start with 3 and expand to 12 questions



# Laboratory Competency Analysis Tool

Survey Instructions

Email Support

Download Report

Individual Assessment Report

**Hello Marty!** Thank you for participating in the Laboratory Competency Analysis Tool (LCAT)! You have successfully contributed to the nation-wide assessment of the public health laboratory workforce.

This report is for the competencies in General Laboratory Practice that addresses the knowledge, skills, and abilities needed to fulfill basic responsibilities for performing sample analyses within a public health laboratory setting.

This Individual Assessment Report (IAR) provides a snapshot of your current proficiency-level in the assessed sub-competencies. Your IAR may be used to help identify areas of strength or areas in which there may be a need for additional training. If that is the case, then we recommend that you discuss the possibility of future training(s) with your immediate supervisor.

It is important to note that each competency and sub-competency within a particular domain may not apply to your specific laboratory responsibilities. Although sets of the LCAT responses may be aggregated for analysis, these analyses will not include your name or other personally identifiable information.



## Sub-Competency Names

- GEN 1.01: General scientific and laboratory concepts and theories
- GEN 1.02: Mathematical and statistical concepts and practices
- GEN 1.03: Scientific and technological advances
- GEN 1.04: Technical skills
- GEN 1.05: Troubleshooting
- GEN 1.06: Model laboratory practices
- GEN 1.07: Documentation
- GEN 1.08: Stewardship of resources
- GEN 1.09: Scientific ethics

## Proficiency Tier Definitions

- **Beginner:** One who can demonstrate performance at an elementary level. May have gained enough classroom or on-the-job experience, but might not be able to apply it consistently. Requires frequent guidance or oversight.
- **Competent:** One who has the necessary ability to cope with many contingencies of laboratory operations with a high degree of independence. Is developing the knowledge and experience to recognize the most salient or important aspect of a situation encountered in the lab.
- **Proficient:** One who uses established principles to manage the many contingencies of laboratory operations. One who has developed sufficient mastery to integrate or design a new task or function. Is able to foresee and adapt to typical events encountered in the lab.
- **Expert:** One who has acquired a mastery to design new strategies, policies, tasks, and functions that support quality operations of a laboratory. Operates from a deep understanding of the situation and focuses on the root of the problem.

<sup>o</sup> [Competency Guidelines for Public Health Laboratory Professional Appendix A. MMWR, May 15, 2015.](#)



## LCAT Feedback Survey

We thank you for your time spent taking this survey.  
Your response has been recorded.

- Feedback survey responses being used to make changes to the final demo product.

# **The Laboratory Competency Assessment Tool**

Results of Early Beta Testing

# Beta-testing

There were ### total of Beta-test survey takers  
Demographics showed:

# Stratified Results

# Commonly mentioned issues

# Well received areas



# Future Developments

## Aggregate Data

### Type of Assessment:

Please indicate for whom you are completing the LCAT to determine the level of competency. Is it for yourself, your group, your entire laboratory? Please click the appropriate option.

Individual

Lab Unit/Division

Entire Laboratory

Go Back

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# Acknowledgements

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- Eva Perlman
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# APHL Emerging Leaders Program, Cohort 8

Add group photo