

Master of Public Health
Integrative Learning Experience Report

Improving Clinical Laboratory Safety Knowledge Through Multi-Modal Interventions

by

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Summary/Abstract

This project examined the safety culture of the clinical laboratory at Irwin Army Community Hospital and worked to strengthen it through evidence-based interventions. The project starts by creating a safety knowledge and culture survey based on requirements from OSHA, CLIA, CAP, the Joint Commission, and CDC. Twelve staff members across multiple laboratory sections completed the assessment. Their responses showed that the laboratory has a solid foundation in areas such as PPE use, equipment safety, and emergency procedures, but also revealed several important gaps. The most notable weaknesses involved the use and verification of biosafety cabinets and fume hoods, waste management, and the steps required after an exposure or patient identification error. Most staff viewed the laboratory's overall safety culture positively. Using these results, targeted training tools were used in the form of fact sheets, direct communication, and training lessons to address both immediate training needs and longer-term system improvements. Early feedback showed that staff confidence improved, particularly in the areas identified as weaknesses. Taken together, the project demonstrates that a focused assessment combined with practical training materials can meaningfully improve laboratory safety knowledge and help build a more consistent and proactive safety culture.

Subject Keywords: laboratory safety; safety culture; biosafety; chemical hygiene; occupational health; clinical laboratory; regulatory standards; OSHA; CLIA; CAP; public health education.

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Chapter 1 - Literature Review

Introduction

Clinical laboratories are essential in healthcare, providing diagnostic testing, specimen handling, and patient reporting. These environments pose unique hazards, including infectious agents, sharps, chemical exposures, and regulatory complexity. Establishing a strong safety culture in laboratories is vital to prevent staff injuries and patient safety events. Safety culture refers to shared values, norms, attitudes, and behaviors regarding safety, whereas safety climate measures workforce perceptions at a specific point in time. This review examines measurement strategies, evidence linking safety culture to outcomes, and interventions designed to improve laboratory safety, with implications for survey and training program development.

Conceptual Foundations: Safety Culture in Laboratory Contexts

Safety culture research in healthcare demonstrates that culture impacts adherence to protocols, incident reporting, and error reduction (Lee, Scott, Dahinten, & et al., 2019). Laboratories have additional complexity: multiple professional roles (phlebotomists, technicians, technologists, pathologists), varied workflows (collection, transport, analysis), and multiple overlapping regulations such as OSHA, CLIA, and CAP. General healthcare safety-culture tools may not fully capture lab-specific risks, such as specimen misidentification or bloodborne pathogen exposure (Schröder, Huang, Ellis, Gibson, & Wayne, 2016).

Measuring Safety Culture in Clinical Laboratories: Survey Instruments and Psychometric Considerations

Surveys are the most common approach to measure safety climate and culture. Standard instruments include the Hospital Survey on Patient Safety Culture (HSPSC) and adapted versions for laboratories (Ayi & Hon, 2018). Lab-specific tools, such as the Chemistry Laboratory Safety Survey (CLASS), assess domains like leadership, communication, reporting systems, and learning culture (Faulconer, Dixon, Griffith, & Frank, 2020). Psychometric considerations include internal consistency, factor structure, and the ability to detect change across units and roles.

Empirical Applications

Lab-specific studies show meaningful variability across units and roles. For instance, a Spain-based study found strengths in teamwork but weaknesses in non-punitive response to error (Giménez-Marín, Marín-García, et al., 2015). Other studies report correlations between high safety-climate scores and adherence to PPE and sharps protocols (Keckler, Anderson, McAllister, Rasheed, & Noble-Wang, 2019). These findings demonstrate feasibility and diagnostic value, though limitations include small sample sizes and cross-sectional designs.

Evidence Linking Safety Culture to Outcomes: Reporting, Compliance, and Incident Rates

Positive safety culture is associated with increased incident reporting, better compliance with PPE, and reduced near-miss rates (Kim, et al., 2021; Gao & Deeprasert, 2025). Lab-specific studies report that units with higher safety-climate scores have fewer needlestick events and near misses (Abu-Siniyeh & Al-Shehri, 2021). Multi-component interventions that include leadership engagement, audits, and feedback improve compliance and safety outcomes (Faulconer et al., 2020).

Training Effectiveness and Behavior Change

Structured training programs on bloodborne pathogens, biosafety, and standard precautions improve knowledge and, in some cases, behavior (Mahmoud & Sabry, 2019). However, sustained behavior change often requires reinforcement, feedback, and integration with organizational policies (Bond, Lucero, & Marsh, 2020). DEI and psychological safety also influence whether staff report errors or near-misses (Kimble-Hill, 2021).

Interventions to Improve Laboratory Safety Culture: Multi-Component Programs

Effective programs combine leadership support, frontline staff involvement, safety audits, and systemic interventions (Keckler et al., 2019). For example, biosafety inspection programs with feedback loops increased compliance and improved climate scores (Schröder et al., 2016). Engineering controls, PPE, and SOP enhancements reinforce culture.

Psychosocial Factors and Inclusion

Psychological safety, staff feeling safe to report errors, and inclusive practices contribute to a positive culture. Identity-based threats or marginalization can suppress reporting, making DEI frameworks integral to successful interventions (Kimble-Hill, 2021).

Implications for Survey and Training Program Design

- **Mixed-Item Approach:** Combine Likert-scale competency items with scenario-based decision questions on biosafety, sharps, specimen ID, chemical hygiene, and emergency preparedness (Keckler et al., 2019; Mahmoud & Sabry, 2019).
- **Regulatory Mapping:** Link survey items to OSHA, CLIA, CAP, and CDC guidelines for compliance-focused interventions (OSHA, 2022).
- **Baseline and Follow-Up Measurement:** Enable evaluation of change over time, and integrate incident/near-miss metrics.
- **Feedback Loops:** Share survey results with staff, engage safety champions, and target interventions.
- **Training Embedded in Systems:** Training alone is insufficient; leadership, engineering, and SOPs support sustainable change.

Gaps and Future Research

- Few longitudinal studies linking culture interventions to objective safety outcomes.
- Limited validated lab-specific survey instruments with normative data.
- Research needed on lab culture interventions' effect on staff wellness and patient safety outcomes.
- DEI and psychological-safety interactions with lab safety reporting remain underexplored.

Conclusion

Safety culture is a critical determinant of occupational and patient safety in clinical laboratories. Evidence supports targeted surveys, scenario-based assessments, and multi-component interventions. Integrating regulatory alignment, DEI considerations, and feedback loops enhances adoption and sustainability. This framework supports the development of effective laboratory safety surveys and training programs.

Chapter 2 - Learning Objectives and Project Description

This project was performed at Irwin Army Community Hospital (IACH) in Fort Riley. IACH provides comprehensive medical, surgical, and preventive care services to active-duty service members, veterans, and their families as part of the Military Health System under the Defense Health Agency (DHA). The hospital's mission is to deliver safe, high-quality, and patient-centered healthcare that ensures medical readiness and supports the health and resilience of the military community. IACH is organized into multiple clinical and administrative departments that work collaboratively to meet this mission, including primary care, specialty medicine, behavioral health, surgery, pharmacy, and clinical laboratory services.

As the Chemistry Laboratory Supervisor at Irwin Army Community Hospital, I lead the chemistry section of the clinical laboratory, which provides essential diagnostic testing in support of patient care and operational readiness. The laboratory operates under strict regulatory and accreditation standards established by the College of American Pathologists (CAP), the Clinical Laboratory Improvement Amendments (CLIA), The Joint Commission (TJC), the Food and Drug Administration (FDA), and the Department of Defense (DoD). In this role, I ensure compliance with these standards through oversight of quality control, equipment maintenance, method validation, and following safety protocols. As a supervisor, I am tasked with ensuring all medical laboratory technicians (MLTs) and medical laboratory scientists (MLSs) are taught and follow all standards.

Laboratory Chief, 1LT Christopher Del Rio, is serving as the site preceptor. He started as a medical laboratory specialist and cytotechnologist at William Beaumont Army Medical Center. 1LT Christopher Del Rio Now serves as the Chief of the Department of Pathology at Irwin Army Community Hospital.

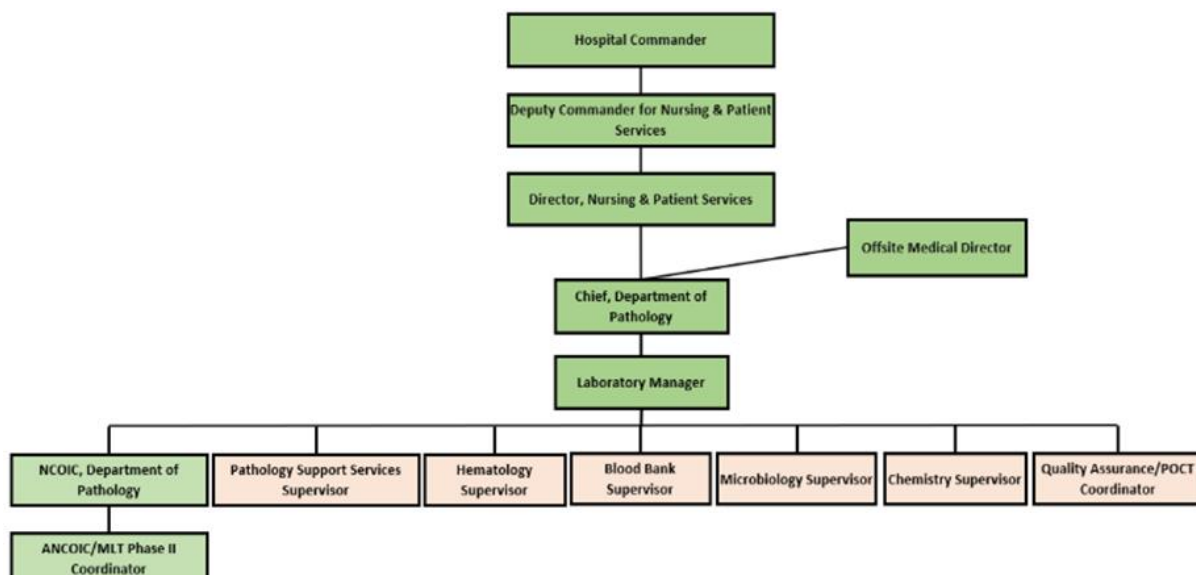


Figure 2.1 Environmental Health and Safety Organization Chart

The overall goal of this project is to improve safety and improve employee health at IACH. This goal was achieved using five steps, each with individual goals and competencies addressed:

1. Assess and Analyze Safety Knowledge and Culture

Objective: Design and implement a validated survey instrument to evaluate laboratory safety knowledge and decision-making across roles. The survey spanned the 15 laboratory safety areas found in appendix 2.

Competency Alignment:

MPH 4: Apply evidence-based approaches to assess population and occupational health needs.

MPH 7: Assess population needs, assets, and capacities that affect community health.

2. Translate Assessment Findings into Immediate Targeted Interventions

Objective: Use survey data to identify key safety gaps and develop targeted educational fact sheets.

Competency Alignment:

MPH 8: Apply awareness of cultural values and practices to the design of public health policies or programs.

MPH 13: Propose strategies to identify stakeholders and build coalitions to influence public health outcomes.

3. Create a Lesson Plan for Individuals that Want to be Safety Leaders

Objective: Use system thinking tools and the regulation list found in appendix 2 to create a systemic safety lesson plan.

Competency Alignment:

MPH 21: Perform systems thinking to address organizational and safety challenges.

MPH 9: Design a population-based policy, program, project, or intervention.

4. Develop a sample lesson

Objective: Produce a digital training program using evidence-based adult learning principles, incorporating regulatory standards, and accessible learning materials for diverse laboratory staff.

Competency Alignment:

MPH 16: Apply principles of leadership, governance, and management, including creating vision, empowering others, and fostering collaboration.

MPH 19: Communicate audience-appropriate public health content, both in writing and through oral presentation.

5. Evaluate Outcomes and Recommend Continuous Improvement Strategies

Objective: Develop and apply a scoring and feedback framework to measure knowledge improvement and safety behavior changes following training.

Competency Alignment:

MPH 22: Design and evaluate systems to improve public health outcomes.

MPH 20: Select communication strategies for different audiences and sectors.

Deliverables:

As explained in the APE report, five portfolio products were created. These are listed below, along with their corresponding appendix location in this ILE report.

- Comprehensive Clinical Laboratory Safety Knowledge & Culture Survey (Appendix 1)
- Safety Fact Sheets (Appendix 3)
- Clinical Laboratory Safety Curriculum (Appendix 5)
- Sample Safety Topic Presentation (large file/available on request)
- Final Evaluation Report with Recommendations for Improvement (Appendix 4)

Chapter 3 – Results

Introduction

Safety culture is a critical determinant of occupational and patient safety in clinical laboratories. Evidence supports targeted surveys, scenario-based assessments, and multi-component interventions. Integrating regulatory alignment, personnel considerations, and feedback loops enhance adoption and sustainability.

Participant Demographics

Overall, 25 people work at the Irwin Army Community Hospital (IACH) laboratory and were the subjects of this project's aim of improving safety. 12 of the 25 people agreed to take part in the safety survey. The participants worked in various laboratory departments, as seen in figures 3.1 and 3.2, with various years of experience, as seen in figure 3.3.

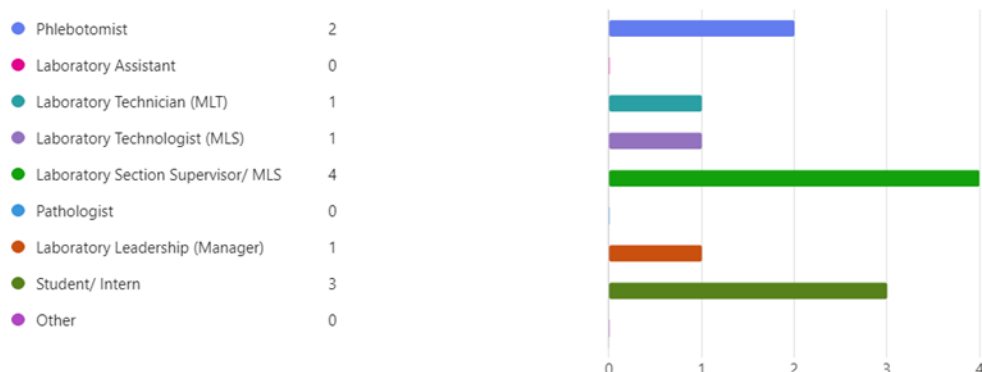


Figure 3.1: Lab Roles of Survey Participants

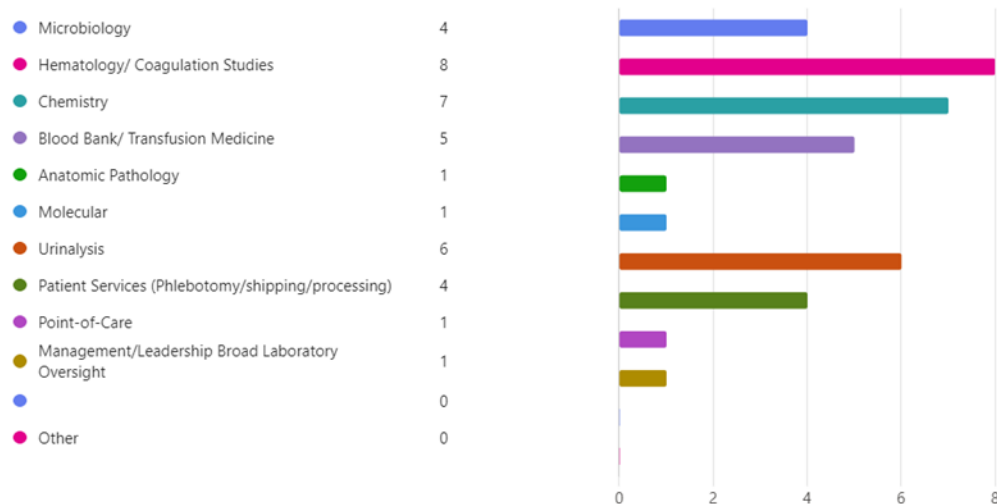


Figure 3.2: Work Areas of Survey Participants

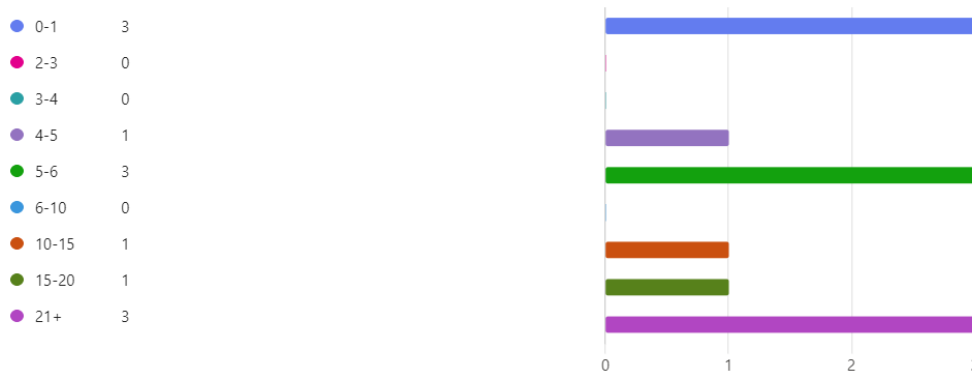


Figure 3.3: Years of Experience for Survey Participants

Top IACH Strengths

The survey found that the staff at IACH were comfortable with many areas of safety. Of the 15 areas of clinical laboratory safety that was part of the survey, seven areas showed no issues with confidence or knowledge gaps.

Top strengths included:

- Following manufacturer instructions for laboratory instruments.
- Familiarity with PPE.
- Emergency eyewash operation.
- HIPAA regulations and data protection.

Top IACH Gaps

The survey found that the staff at IACH were comfortable with many areas of safety. Of the 15 areas of clinical laboratory safety that was part of the survey, seven areas showed no issues with confidence or knowledge gaps.

Top knowledge gaps included:

- Knowledge of steps to take after a bloodborne pathogen exposure.
- Waste management.
- Ability to interpret safety data sheets and chemical hazards.
- Knowledge of biosafety cabinets and fume hoods.
- Patient identification and error handling.

Safety Culture Perceptions

The survey found that IACH has a high perception of safety culture. Employees feel empowered to report safety concerns and believe their concerns will be taken seriously as shown in figure 3.5. Only 8% of staff view the IACH safety culture negatively as seen in figure 3.4.

78. I understand my role in fostering a positive safety culture.

● Strongly Agree ● Agree ● Neutral ● Disagree ● Strongly Disagree

My confidence level:

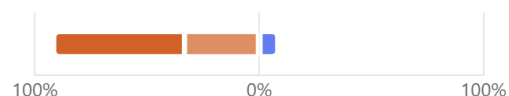


Figure 3.4: Role in Fostering a Positive Safety Culture

80. My safety concerns will be taken seriously.

● Strongly Agree ● Agree ● Neutral ● Disagree ● Strongly Disagree

My confidence level:

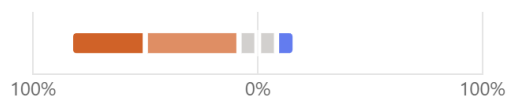


Figure 3.5: Belief that Safety Concerns Will Be Taken Seriously

Training and Intervention Outcomes

Training and safety intervention was the follow-up to the safety survey. Safety fact sheets achieved the goal of immediate targeted interventions for process knowledge gaps, such as bloodborne pathogen exposure and patient identification errors. Larger safety knowledge gaps required physical safety training as demonstrated with an example lesson on biosafety cabinets. Additional gaps were filled through discussion during daily meetings, such as the defend-in-place policy.

Summary of Key Findings

Findings were summarized in the final report delivered to 1LT Del Rio as seen in Appendix 4. The fifteen safety area findings were summarized below:

Biosafety & Bloodborne Pathogens

Respondents report reasonably high confidence with biosafety fundamentals but lack knowledge in accident response.

Specimen Collection & Phlebotomy

Responses show a potential issue with proper patient identification, specimen labeling, and knowledge of misidentification procedures.

PPE & Hand Hygiene

All responses showed high confidence and knowledge of PPE and proper hand hygiene.

Sharp Safety

All responses showed high confidence and knowledge of sharp handling, but some respondents showed a lack of knowledge on proper needlestick response.

Specimen Handling & Transportation

Responses showed high confidence in transportation of infectious material; however, few responses demonstrated accurate knowledge of shipping requirements. A few respondents showed little confidence in chain-of-custody knowledge.

Chemical Hygiene & Hazards Communication

Responses showed a need for training in chemical labeling, hazard communication, and SDS interpretation.

Waste Management and Spill Response

Responses showed low knowledge of biological and chemical waste management.

Engineering Controls

Responses showed a need for training in biosafety cabinet and fume cabinet usage and maintenance.

Equipment & Instrument Safety

All responses showed high confidence and knowledge.

Ergonomics

All responses showed high confidence and knowledge.

Emergency Preparedness

All responses showed high confidence and knowledge. One individual requested training on defend-in-place procedure.

Quality Assurance & Accreditation

All responses showed high confidence and knowledge.

Information Security & Privacy

All responses showed high confidence and knowledge.

Communication & Safety Culture

All responses showed high confidence and knowledge.

Role Specific Items

All responses showed high confidence and knowledge.

Chapter 4 – Discussion

Introduction

This project attempted to strengthen the safety culture of clinical laboratories by identifying knowledge gaps, aligning regulatory expectations, and implementing targeted training interventions. The results demonstrate that while laboratory professionals exhibit strong foundational safety awareness, several domains require focused attention. This chapter interprets these findings within the broader context of the laboratory safety literature, public health systems, and regulatory frameworks.

Key Points

Safety Knowledge and Compliance Gaps

Findings revealed variable safety knowledge across domains, with the highest competency in personal protective equipment (PPE) knowledge and lower performance in chemical hygiene. These patterns are consistent with the literature showing chemical safety as one of the most frequently cited laboratory deficiencies (National Research Council, 2011). The persistence of gaps despite high awareness indicates that compliance fatigue and contextual constraints, such as workload and resource availability, may undermine best practices (Faulconer et al., 2020).

Safety Culture and Leadership Perception

One positive found in this project was that over 90% of participants recognized the need for a strong safety culture. Participants believed that they knew their role in safety culture, they believed their voices were heard when it came to safety, and they believed that leadership cared about their safety. This belief is incredibly important as safety is just as much about behavior and emotions as it is about technical safeguards and knowledge (Kimble-Hill, 2021).

Effectiveness of Training and Educational Interventions

Using surveying techniques allowed for a quick snapshot of safety gaps in the facility and allowed for each gap to be addressed in an efficient manner. For employees that lacked knowledge in a safety process, targeted safety education fact sheets and general discussion allowed for those gaps to be filled quickly. While broader safety knowledge gaps required more robust safety education material. Mahmoud and Sabry (2019) showed that regulatory safety training targeted at a clinical laboratory reduced occupational hazards and prevented work injury in the clinical laboratory.

Other Comparisons with Existing Literature

The overall results affirm the importance of continuous safety education and leadership engagement in reducing preventable laboratory incidents.

- Schröder, Huang, Ellis, Gibson, & Wayne (2016) showed that the laboratory requires specific safety training that is different from the general hospital employee safety training. This project demonstrated specific knowledge gaps that would not be needed in all hospital staff.
- Ayi & Hon (2018) showed how safety surveys could be important in finding safety gaps in a laboratory. While their work showed a broader survey using academic laboratories, this project showed that surveys can be a great technique for finding specific gaps in clinical labs.

Collectively, the evidence supports that data-driven, behaviorally informed interventions like those developed in this project can advance laboratory safety beyond compliance into a culture of continuous improvement.

Implications for Public Health Practice

For Laboratory Leadership

- Implement ongoing feedback mechanisms linking incident reporting to leadership accountability.
- Use survey data to prioritize high-risk domains in the annual safety plan.
- Align staff evaluations with safety performance metrics.

For Environmental Health and Safety (EHS) Professionals

- Incorporate scenario-based learning into annual refresher courses.
- Establish peer safety champions to model safe behaviors.

For Public Health Education

- Integrate these findings into MPH and MLS curricula to bridge theory and practice.
- Encourage use of open-access digital training platforms like Canvas for workforce education.
- Promote collaboration between academic public health programs and clinical laboratories for applied learning experiences.

Limitations

The project's convenience sample may not represent all laboratory settings. Furthermore, the volunteer status of the survey and self-reported survey responses can introduce bias as those that have more knowledge of safety may be more likely to take a survey. The smaller sample size may have increased the margin of error on the survey results. Moreover, while education can reduce safety knowledge gaps, the long-term impacts were not assessed. Future studies should incorporate follow-up audits, and incident rate monitoring should be conducted.

Recommendations for Future Research and Practice

1. Expand the survey across diverse laboratory types (clinical, academic, public health).
2. Integrate behavioral metrics (e.g., observation-based audits) alongside self-assessment tools.
3. Develop more robust and specific training.

Conclusion

This applied project demonstrated that a structured, data-informed approach combining assessment, education, and regulatory integration can meaningfully enhance laboratory safety culture. The improvements observed in safety knowledge, confidence, and leadership engagement underscore the value of combining public health systems thinking with occupational safety frameworks. Ultimately, fostering a culture of safety within laboratories not only protects workers but also ensures the integrity of patient testing and the quality of public health surveillance, fulfilling the core mission of the laboratory as a pillar of population health.

Chapter 5 - Competencies

Student Attainment of MPH Foundational Competencies

The Master of Public Health (MPH) program at Kansas State University is guided by 22 foundational competencies across seven major topic areas. Foundational competencies cover topics in evidence-based approaches to public health, public health and health care systems, planning and management to promote health, policy in public health, leadership, communication, interprofessional practice, and systems thinking. MPH core coursework, including MPH 701 “Biostatistics”, MPH 720 “Administration of Health Care Organizations”, MPH 754 “Epidemiology”, MPH 802 “Environmental Health”, and MPH 818 “Social and Behavioral Basis of Public Health” collectively provide instruction across all 22 foundational competencies. All MPH program students must complete these five core courses. Table 5.3 provides the full list of foundational MPH competencies and alignment of core courses to each competency.

Students select at least five of the foundational competencies to address as part of the Applied Practice Experience through creation of public health products. Products may address a single competency or a combination of competencies; however, all five selected competencies must be addressed across the combination of products. This section details attainment of five of the 22 foundational competencies across creation of five core products during the Applied Practice Experience with Irwin Army Community Hospital. Table 5.1 provides a summary of attainment of the five competencies discussed in this section and Table 5.2 aligns the five core products across many of the foundational program competencies beyond the five discussed in detail in this section.

Competency 7: Assess population needs, assets, and capacities that affect communities’ health.

The project assessed the clinical laboratory workforce as a defined population within the hospital system. The project used anonymous surveys to identify strengths and gaps in safety knowledge and regulatory compliance. This assessment guided the design of the safety curriculum, fact sheets, and leadership report.

Competency 9: Design a population-based policy, program, project or intervention

The project produced a comprehensive, evidence-based Clinical Laboratory Safety Curriculum and supporting educational tools that serve as structured interventions to enhance safety culture. Together, these deliverables form a sustainable training model integrating CLIA, CAP, Joint Commission, and OSHA standards into a cohesive educational framework for laboratory professionals.

Competency 16: Apply leadership and/or management principles to address a relevant issue.

Leadership and management principles were applied throughout the project—particularly in developing the Safety Training Recommendation Report and safety education lessons for laboratory leadership. The project emphasized interdepartmental collaboration, clear communication, and shared accountability in driving improvement in

laboratory and safety culture.

Competency 19: Communicate audience-appropriate (i.e., non-academic, non-peer audience) public health content, both in writing and through oral presentation to a non-academic, non-peer audience with attention to factors such as literacy and health literacy

This project contained many opportunities for communication. Written communication was done in the form of fact sheets, the distribution of a sample training course, and the delivery of the final recommendation report. Orally, safety gaps were discussed during daily huddle, and the final report recommendations were discussed with leadership. Each product demonstrated the ability to translate technical safety data into actionable, comprehensible materials that drive engagement and compliance.

Competency 22: Apply a systems thinking tool to visually represent a public health issue in a format other than standard narrative

The project utilized both a process map and a stock-and-flow diagram to represent clinical laboratory safety as a dynamic system. The process map illustrated workflows, communication channels, training pathways, and reporting procedures, identifying bottlenecks and opportunities for reinforcement. The stock-and-flow diagram modeled accumulation of safety knowledge and overall safety culture (“stocks”) and the rates of change (“flows”) such as training uptake, reinforcement, and knowledge decay. Feedback loops, including safety incident reporting and leadership review, highlighted system dynamics and leverage points for sustainable improvement. Together, these tools (which may be found in the APE report) provided a holistic visual representation of the laboratory safety ecosystem and informed actionable, data-driven leadership strategies.

Table 5.1 Summary of MPH Foundational Competencies

Number and Competency		Description
7	Assess population needs, assets, and capacities that affect communities’ health.	The project assessed the clinical laboratory workforce as a defined population within the hospital system, identifying strengths and gaps in safety knowledge and regulatory compliance. This assessment guided the design of the <i>safety curriculum, fact sheets, and leadership report</i> , addressing needs while leveraging institutional assets such as existing EHS infrastructure and leadership support.
9	Design a population-based policy, program, project, or intervention.	The project produced a comprehensive, evidence-based Clinical Laboratory Safety Curriculum and supporting educational tools that serve as structured interventions

		to enhance safety culture. Together, these deliverables form a sustainable training model integrating CLIA, CAP, Joint Commission, and OSHA standards into a cohesive educational framework for laboratory professionals.
16	Apply leadership and/or management principles to address a relevant issue.	Leadership and management principles were applied throughout the project—particularly in developing the <i>Safety Training Recommendation Report</i> and <i>safety education presentation</i> for hospital leadership. The project emphasized interdepartmental collaboration, clear communication, and shared accountability in driving improvement in laboratory and hospital-wide safety culture.
19	Communicate audience-appropriate (i.e., non-academic, non-peer audience) public health content, both in writing and through oral presentation to a non-academic, non-peer audience with attention to factors such as literacy and health literacy	Communication was a core component of the project. The development of fact sheets, safety topic presentations, and the Safety Training Recommendation Report required tailoring complex regulatory information (OSHA, CLIA, CAP, Joint Commission) to diverse audiences including hospital leadership, clinical laboratory professionals, and other healthcare staff. Each product demonstrated the ability to translate technical safety data into actionable, comprehensible materials that drive engagement and compliance.
22	Apply a systems thinking tool to visually represent a public health issue in a format other than a standard narrative.	The project utilized both a process map and a stock-and-flow diagram to represent clinical laboratory safety as a dynamic system. The process map illustrated workflows, communication channels, training pathways, and reporting procedures, identifying bottlenecks and opportunities for reinforcement. The stock-and-flow diagram modeled accumulation of safety knowledge and overall safety culture (“stocks”) and the rates of change (“flows”) such as training uptake, reinforcement, and knowledge decay. Feedback loops, including safety incident reporting and leadership review, highlighted system dynamics and leverage points for sustainable improvement. Together, these tools provided a holistic visual representation of the laboratory safety

		ecosystem and informed actionable, data-driven leadership strategies.
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Table 5.2 Applied Practice Experience Product and Foundational Competencies Addressed

Portfolio Product		Number and Competency Addressed	
1	Laboratory Safety Competency Survey	1	Apply epidemiological methods to settings and situations in public health practice.
		2	Select quantitative and qualitative data collection methods appropriate for a given public health context.
		3	Analyze quantitative and qualitative data using biostatistics, informatics, computer-based programming and software, as appropriate.
		4	Interpret results of data analysis for public health research, policy, or practice.
		7	Assess population needs, assets, and capacities that affect communities' health.
		9	Design a population-based policy, program, project, or intervention.
		11	Select methods to evaluate public health programs.
		15	Evaluate policies for their impact on public health and health equity.
		21	Integrate perspectives from other sectors and/or professions to promote and advance population health.
2	Safety Signage and Fact Sheets	3	Analyze quantitative and qualitative data using informatics.
		5	Compare the organization, structure and function of health care, public health, and regulatory systems.
		8	Apply awareness of cultural values and practices to the design, implementation, or critique of public health policies or programs.
		13	Propose strategies to identify stakeholders and build coalitions and partnerships for influencing public health outcomes.
		18	Select communication strategies for different audiences and sectors.
		19	Communicate audience-appropriate public health content, both in writing and through oral presentation.
		20	Describe the importance of cultural competence in communicating public health content.

3	Clinical Laboratory Safety Curriculum	2	Select quantitative and qualitative data collection methods appropriate for a given public health context.
		5	Compare the organization, structure and function of health care, public health, and regulatory systems.
		7	Assess population needs, assets and capacities that affect communities' health.
		9	Design a population-based policy, program, project or intervention.
		11	Select methods to evaluate public health programs.
		13	Propose strategies to identify stakeholders and build coalitions and partnerships for influencing public health outcomes
		16	Apply leadership and/or management principles to address a relevant issue.
		20	Describe the importance of cultural competencies in communicating public health content.
		21	Integrate perspectives from other sectors and/or professions to promote and advance population health.
4	Topic Presentations	12	Discuss multiple dimensions of the policy-making process.
		13	Propose strategies to build partnerships for influencing outcomes.
		14	Advocate for political, social or economic policies that improve health.
		16	Apply leadership or management principles.
		18	Select communication strategies for different audiences.
		19	Communicate audience-appropriate (i.e., non-academic, non-peer audience) public health content, both in writing and through oral presentation.
		21	Integrate perspectives from other sectors.
5	Safety Training Recommendation Report to Leadership for Laboratory Staff	5	Compare the structure and function of health care and public health systems.
		12	Discuss the policy-making process, including ethics and evidence.
		13	Propose strategies to build coalitions and partnerships.
		14	Advocate for political, social or economic policies to improve health.
		15	Evaluate policies for their impact on health and equity.
		16	Apply leadership and management principles.
		17	Apply negotiation and mediation skills.
		21	Integrate perspectives from other sectors.
		22	Apply a systems thinking tool.

Table 5.3 MPH Foundational Competencies Course Mapping

22 Public Health Foundational Competencies Course Mapping	MPH 701	MP H 720	MPH 754	MPH 802	MPH 818
Evidence-based Approaches to Public Health					
1. Apply epidemiological methods to settings and situations in public health practice	X		X		
2. Select quantitative and qualitative data collection methods appropriate for a given public health context	X	X	X		
3. Analyze quantitative and qualitative data using biostatistics, informatics, computer-based programming and software, as appropriate	X	X	X		
4. Interpret results of data analysis for public health research, policy or practice	X		X		
Public Health and Health Care Systems					
5. Compare the organization, structure and function of health care, public health and regulatory systems across national and international settings		x			
6. Discuss the means by which structural bias, social inequities and racism undermine health and create challenges to achieving health equity at organizational, community and systemic levels					x
Planning and Management to Promote Health					
7. Assess population needs, assets and capacities that affect communities' health		x		x	
8. Apply awareness of cultural values and practices to the design, implementation, or critique of public health policies or programs					x
9. Design a population-based policy, program, project or intervention			x		
10. Explain basic principles and tools of budget and resource management		x	x		
11. Select methods to evaluate public health programs	x	x	x		
Policy in Public Health					
12. Discuss multiple dimensions of the policy-making process, including the roles of ethics and evidence		x	x	x	
13. Propose strategies to identify stakeholders and build coalitions and partnerships for influencing public health outcomes		x		x	x

14. Advocate for political, social or economic policies and programs that will improve health in diverse populations		x			x
15. Evaluate policies for their impact on public health and health equity		x		x	
Leadership					
16. Apply leadership and/or management principles to address a relevant issue		x			x
17. Apply negotiation and mediation skills to address organizational or community challenges		x			
Communication					
18. Select communication strategies for different audiences and sectors	DMP 815, FNDH 880 or KIN 796				
19. Communicate audience-appropriate (i.e., non-academic, non-peer audience) public health content, both in writing and through oral presentation	DMP 815, FNDH 880 or KIN 796				
20. Describe the importance of cultural competence in communicating public health content		x			x
Interprofessional Practice					
21. Integrate perspectives from other sectors and/or professions to promote and advance population health		x			x
Systems Thinking					
22. Apply a systems thinking tool to visually represent a public health issue in a format other than a standard narrative			X	x	

Discussion of Competencies

MPH program foundational competencies were attained through targeted coursework and applied experiences. Competency 7, assessing population needs, assets, and capacities that affect communities' health, was achieved through the analysis of anonymous survey. Competency 9, designing population-based programs and interventions, was achieved through the creation, implementation, and refinement of safety education to address gaps in laboratory safety environments. Competency 16, apply leadership and/or management principles to address a relevant issue, was applied through the creation of fact sheets to address immediate issues, the creation of sample lessons to address long term training, and the leadership recommendation report to address safety gaps. Competency 19, communicating audience-appropriate public health content, was achieved through written reports and educational fact sheets. Lastly, Competency 22 applied a systems thinking tool to visually represent a public health issue in a format other than a standard narrative, was accomplished by bringing together different departments of the hospital to reinforcing a multidisciplinary approach to public health education.

Student Attainment of MPH Emphasis Area Competencies

The Applied Practice Experience (APE) titled "Strengthening Safety Culture in Clinical Laboratories Through Knowledge Assessment and Targeted Training Interventions" aligned closely with the core competencies of the Infectious Diseases and Zoonoses (IDZ) emphasis area. Through the design and implementation of a safety knowledge and culture survey and safety training modules, the project integrated key themes in infectious disease prevention, laboratory biosafety, immunologic response, environmental exposure control, and disease surveillance.

The activities and deliverables provided hands-on experience with real-world public health systems that protect both laboratory professionals and the broader population from infectious hazards. This project provided a robust, interdisciplinary framework for applying the IDZ emphasis competencies to an occupational health and safety context. By focusing on clinical laboratory biosafety, it bridged infectious disease theory with practical application in pathogen control and prevention.

Competency 1 (Pathogenic Mechanisms) was demonstrated through the design of learning modules and survey questions that directly addressed pathogen characteristics, transmission routes, and biosafety levels. Laboratory staff were educated on the mechanisms of infection transmission and how adherence to engineering controls and PPE disrupts these mechanisms.

Competency 2 (Host Response to Pathogens) was reflected in educational content on immunization policies, immune response to exposure, and the rationale behind post-exposure prophylaxis for bloodborne pathogens. The student reinforced immunological principles in practical decision-making scenarios.

Competency 3 (Environmental Influences) was demonstrated through evaluation of laboratory environmental design and how ecological factors affect infection control.

The project emphasized how environmental health principles directly support infectious disease prevention.

Competency 4 (Disease Surveillance) was met through the survey's use as a surveillance instrument to monitor laboratory safety trends. The analysis of responses provided early indicators of potential exposure risk and served as an example of applied public health surveillance in a workplace context.

Competency 5 (Vectors and Toxins) extended the project's scope beyond human pathogens to include awareness of zoonotic and toxic exposures. This holistic view of disease ecology reflects the One Health perspective emphasized in the IDZ program.

Through integration of microbiology, epidemiology, immunology, and environmental health, the project fulfilled all five emphasis-specific competencies, demonstrating an advanced ability to apply infectious disease principles to practical safety and policy initiatives within a healthcare laboratory system.

Table 5.4 Summary of MPH Emphasis Area Competencies

MPH Emphasis Area:			
Number and Competency		Description	Required Course*
1	Pathogens/pathogenic mechanisms	Evaluate modes of disease causation and infectious agents.	AAI 852
2	Host response to pathogens/immunology	Investigate the host response to infection.	ASI 540
3	Environmental/ecological influences	Examine the influence of environmental and ecological forces on infectious diseases.	DMP 710
4	Disease surveillance	Analyze disease risk factors and select appropriate surveillance.	DMP 710
5	Disease vectors	Investigate the role of vectors, toxic plants, and other toxins in infectious disease.	DMP 710

Discussion of Area Competencies

Student attainment of Infectious Diseases and Zoonoses emphasis area competencies within the overall MPH program curriculum demonstrates program and learner commitment to comprehensive education in topics related to pathogens and pathogenic mechanisms, host response to pathogens, environmental and ecological influences on infectious diseases, disease surveillance, and diseases vectors. Targeted coursework in vaccinology, principles of animal disease control, environmental health, and One Health supports foundational knowledge in each emphasis area competency. Applied Practice Experience learning objectives, activities, and resulting products provides hands-on, real-world application of the competencies in data analysis, data interpretation, public health intervention selection and implementation, written and oral communication, and collaborative teamwork across interdisciplinary teams. The combined approach of coursework and applied experience provides learners knowledge and expertise toward meaningful contributions in the field of public health across many contexts.

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Appendix 1

Clinical Laboratory Safety Knowledge and Competency Survey

Purpose: Assess self-rated knowledge and objective understanding of critical safety topics for medical/clinical laboratory professionals (phlebotomists, technicians, technologists, pathologists, and management). Results will identify strengths, training needs, and compliance risks across regulatory domains (OSHA, CLIA, The Joint Commission, CAP, FDA, CDC/NIOSH, EPA, DOT/IATA, CLSI, ASCP/AMT competencies).

Instructions: Please answer honestly based on your knowledge and experience. This will be 100% anonymous.

Recommended Likert Anchors for Safety Knowledge

No Knowledge – I am not familiar with this safety requirement/practice.

Basic Awareness – I have heard of it but would not feel confident applying it without guidance.

Working Knowledge – I can usually apply this requirement/practice with occasional help or reminders.

Proficient – I understand and consistently apply this requirement/practice independently.

Expert/Mentor – I have in-depth knowledge and could train or mentor others on this requirement/practice.

* Required

Section 1

Consent, Role, and Context

I consent to participate and allow my de-identified responses to be used for training and safety program improvement. *

☐ Yes ☐ No

2

Select your primary role. *

- ☐ Phlebotomist
- ☐ Laboratory Assistant
- ☐ Laboratory Technician (MLT)
- ☐ Laboratory Technologist (MLS)
- ☐ Laboratory Section Supervisor/ MLS
- ☐ Pathologist
- ☐ Laboratory Leadership (Manager)
- ☐ Other

3

Select all current work areas: *

- ☐ Phlebotomy/Outpatient
- ☐ Phlebotomy/Inpatient Units/Floors
- ☐ Microbiology
- ☐ Hematology/ Coagulation Studies
- ☐ Chemistry
- ☐ Blood Bank/ Transfusion Medicine
- ☐ Pathology/Histology/Cytology
- ☐ Molecular
- ☐ Urinalysis
- ☐ Core Lab
- ☐ Sendouts/Specimen Processing
- ☐ Point-of-Care
- ☐ Management/Leadership Broad Laboratory Oversight
- ☐ Other

2

Years of Lab Experience

- ☐ 0-1
- ☐ 2-3
- ☐ 3-4
- ☐ 4-5
- ☐ 5-6
- ☐ 6-10
- ☐ 10-15
- ☐ 15-20
- ☐ 21+

5

Primary Shift(s) *

- ☐ Days
- ☐ Evenings
- ☐ Nights
- ☐ Weekends

Section 2

Specimen Collection and Phlebotomy (CLSI GP41; OSHA 29 CFR 1910.1030; TJC NPSG.01.01.01; CLIA 42 CFR 493.1252)

I know the correct order of draw for venipuncture. *

No Knowledge: I am not familiar with this safety requirement/ practice.	Basic Awareness: I have heard of it but would not feel confident applying it without guidance.	Working Knowledge: I can usually apply this requirement/ practice with occasional help or reminders.	Proficient: I understand and consistently apply this requirement/ practice independently.	Expert/Mentor: I have in-depth knowledge and could train or mentor others on this requirement practice.
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My confidence level:

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I know the correct order of draw for venipuncture. *

No Knowledge: I am not familiar with this safety requirement/ practice.	Basic Awareness: I have heard of it but would not feel confident applying it without guidance.	Working Knowledge: I can usually apply this requirement/ practice with occasional help or reminders.	Proficient: I understand and consistently apply this requirement/ practice independently.	Expert/Mentor: I have in-depth knowledge and could train or mentor others on this requirement practice.
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My confidence level:

☐☐☐☐☐

8

I understand how to respond if there is a patient identification error. *

No Knowledge: I am not familiar with this safety requirement/ practice.	Basic Awareness: I have heard of it but would not feel confident applying it without guidance.	Working Knowledge: I can usually apply this requirement/ practice with occasional help or reminders.	Proficient: I understand and consistently apply this requirement/ practice independently.	Expert/Mentor: I have in-depth knowledge and could train or mentor others on this requirement practice.
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My confidence level:

☐☐☐☐☐

A patient faints during venipuncture. What should you do first? *

No Knowledge: I am not familiar with this safety requirement/ practice.

Basic Awareness: I have heard of it but would not feel confident applying it without guidance.

Working

Knowledge: I can usually apply this requirement/ practice with occasional help or reminders.

Proficient: I understand and consistently apply this requirement/ practice independently.

Expert/Mentor: I have in-depth knowledge and could train or mentor others on this requirement practice.

My confidence level:

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0

I label specimens at the bedside or in the patient's presence immediately after collection. *

No Knowledge: I am not familiar with this safety requirement/ practice.

Basic Awareness: I have heard of it but would not feel confident applying it without guidance.

Working

Knowledge: I can usually apply this requirement/ practice with occasional help or reminders.

Proficient: I understand and consistently apply this requirement/ practice independently.

Expert/Mentor: I have in-depth knowledge and could train or mentor others on this requirement practice.

My confidence level:

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How long should you perform hand hygiene before putting on gloves? *

☐ 5 sec

☐ 10 sec

☐ 20 sec

☐ 40 sec

After filling two tubes, you realize the patient was not properly identified. What should you do? *

☐ Discard and recollect

☐ Relabel later

☐ Ask nurse

☐ Document as is

1

A patient becomes unconscious while you are in the processes of drawing blood. What do you do?

- ☐ Secure needle and remove tourniquet
- ☐ Call for help
- ☐ Continue draw
- ☐ Leave room to find help

14

Which of these are acceptable patient identifiers? *

- ☐ Full name
- ☐ Date of birth
- ☐ Medical record number
- ☐ Room number

15

Where and when should specimens be labeled? *

- ☐ At bedside or in immediate presence of patient
- ☐ During transport to the lab
- ☐ After transport to the lab during specimen processing
- ☐ At the bench
- ☐ Other

Section 1

Biosafety and Bloodborne Pathogens (OSHA 29 CFR 1910.1030; CDC; BMBL; CLSI M29; CLIA 42 CFR 493.1105)

16

I am familiar with the OSHA Bloodborne Pathogen Standard. *

No Knowledge: I am not familiar with this safety requirement/ practice.	Basic Awareness: I have heard of it but would not feel confident applying it without guidance.	Working Knowledge: I can usually apply this requirement/ practice with occasional help or reminders.	Proficient: I understand and consistently apply this requirement/ practice independently.	Expert/Mentor: I have in-depth knowledge and could train or mentor others on this requirement practice.
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My confidence level:

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17

I can correctly use a biosafety cabinet according to CDC BMBL guidelines



No Knowledge: I am not familiar with this safety requirement/ practice.	Basic Awareness: I have heard of it but would not feel confident applying it without guidance.	Working Knowledge: I can usually apply this requirement/ practice with occasional help or reminders.	Proficient: I understand and consistently apply this requirement/ practice independently.	Expert/Mentor: I have in-depth knowledge and could train or mentor others on this requirement practice.
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My confidence level:

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I know the proper steps to take after a bloodborne pathogens exposure. *

No Knowledge: I am not familiar with this safety requirement/ practice.	Basic Awareness: I have heard of it but would not feel confident applying it without guidance.	Working Knowledge: I can usually apply this requirement/ practice with occasional help or reminders.	Proficient: I understand and consistently apply this requirement/ practice independently.	Expert/Mentor: I have in-depth knowledge and could train or mentor others on this requirement practice.
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My confidence level: ☐ ☐ ☐ ☐ ☐

19

I can identify a biohazard in the laboratory. *

No Knowledge: I am not familiar with this safety requirement/ practice.	Basic Awareness: I have heard of it but would not feel confident applying it without guidance.	Working Knowledge: I can usually apply this requirement/ practice with occasional help or reminders.	Proficient: I understand and consistently apply this requirement/ practice independently.	Expert/Mentor: I have in-depth knowledge and could train or mentor others on this requirement practice.
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My confidence level: ☐ ☐ ☐ ☐ ☐

20

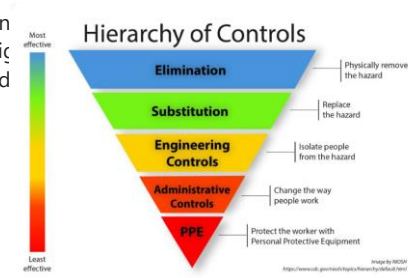
I understand the definition of biohazard and other potentially infectious material (OPIM) as it pertains to bloodborne pathogens. *

No Knowledge: I am not familiar with this safety requirement/ practice.	Basic Awareness: I have heard of it but would not feel confident applying it without guidance.	Working Knowledge: I can usually apply this requirement/ practice with occasional help or reminders.	Proficient: I understand and consistently apply this requirement/ practice independently.	Expert/Mentor: I have in-depth knowledge and could train or mentor others on this requirement practice.
---	--	--	---	---

My confidence level: ☐ ☐ ☐ ☐ ☐

1
Which of the following are engineering controls used to protect against a physical modification to the workplace, equipment, or process design? These controls provide PHYSICAL separation between the hazard and the worker.

- ☐ Sharps container
- ☐ Biosafety cabinet
- ☐ Gloves
- ☐ Hand hygiene
- ☐ Safety training



22

You get a blood splash in your eye while handling a specimen. What is your first action? *

- ☐ Flush at laboratory eyewash for 15 minutes
- ☐ Wipe with tissue
- ☐ Complete task
- ☐ Wipe with water in bathroom

23

You see a coworker working with unknown microbial pathogens outside of the biosafety cabinet. What is the safest response? *

- ☐ Correct immediately. This is an unsafe action.
- ☐ Ignore. It is safe to work with all microbial pathogens on the bench top.
- ☐ Report later to avoid conflict.

Section 4

PPE and Hand Hygiene (OSHA 29 CFR 1910.132/.133/.134; CDC; TJC IC.02.01.01; CLIA 42 CFR 493.1105)

24

I know when gloves must be changed during laboratory operations. *

No Knowledge: I am not familiar with this safety requirement/ practice.

Basic Awareness: I have heard of it but would not feel confident applying it without guidance.

Working Knowledge: I can usually apply this requirement/ practice with occasional help or reminders.

Proficient: I understand and consistently apply this requirement/ practice independently.

Expert/Mentor: I have in-depth knowledge and could train or mentor others on this requirement practice.

My confidence level:

☐☐☐☐☐

25

I can correctly don and doff PPE to prevent contamination. *

No Knowledge: I am not familiar with this safety requirement/ practice.

Basic Awareness: I have heard of it but would not feel confident applying it without guidance.

Working Knowledge: I can usually apply this requirement/ practice with occasional help or reminders.

Proficient: I understand and consistently apply this requirement/ practice independently.

Expert/Mentor: I have in-depth knowledge and could train or mentor others on this requirement practice.

My confidence level:

☐☐☐☐☐

26

I understand respiratory protection requirements, including fit testing requirements for N95 respirators.

*

No Knowledge: I am not familiar with this safety requirement/ practice.

Basic Awareness: I have heard of it but would not feel confident applying it without guidance.

Working Knowledge: I can usually apply this requirement/ practice with occasional help or reminders.

Proficient: I understand and consistently apply this requirement/ practice independently.

Expert/Mentor: I have in-depth knowledge and could train or mentor others on this requirement practice.

My confidence level:

☐☐☐☐☐

Section 4
Alcohol-based hand sanitizers should contain at least what percentage of alcohol? *

- ☐ 40%
- ☐ 50%
- ☐ 60%
- ☐ 80%

28

N95 respirators have straps that adhere them to the face for the designed purpose. If a worker is wearing a N95 respirator while working with pathogens that cause infection through the respiratory system and one of the straps breaks mid-task, what is the correct action? *

- ☐ Stop and replace
- ☐ Continue work if only one strap breaks
- ☐ Ask a coworker to complete the task
- ☐ Remove the respirator and tape strap



Section 5

Sharps Safety (OSHA 29 CFR 1910.1030(d)(2); NIOSH; FDA)

29

I am familiar with FDA-approved safety-engineered devices. *

No Knowledge: I am not familiar with this safety requirement/ practice.

Basic Awareness: I have heard of it but would not feel confident applying it without guidance.

Working Knowledge: I can usually apply this requirement/ practice with occasional help or reminders.

Proficient: I understand and consistently apply this requirement/ practice independently.

Expert/Mentor: I have in-depth knowledge and could train or mentor others on this requirement practice.

My confidence level:

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30

I can correctly dispose of sharps in the clinical laboratory. *

No Knowledge: I am not familiar with this safety requirement/ practice.

Basic Awareness: I have heard of it but would not feel confident applying it without guidance.

Working Knowledge: I can usually apply this requirement/ practice with occasional help or reminders.

Proficient: I understand and consistently apply this requirement/ practice independently.

Expert/Mentor: I have in-depth knowledge and could train or mentor others on this requirement practice.

My confidence level:

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31

I understand what to do after a needlestick injury. *

No Knowledge: I am not familiar with this safety requirement/ practice.

Basic Awareness: I have heard of it but would not feel confident applying it without guidance.

Working Knowledge: I can usually apply this requirement/ practice with occasional help or reminders.

Proficient: I understand and consistently apply this requirement/ practice independently.

Expert/Mentor: I have in-depth knowledge and could train or mentor others on this requirement practice.

My confidence level:

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Section 5

Which of the following is allowed after removing a needle from a patient's arm?

- ☐ Recapping
- ☐ One-handed scoop
- ☐ Direct disposal
- ☐ Activation of the safety device prior to disposal

33

While drawing blood, a patient moves suddenly causing a near miss with a needle. What should you do?

*

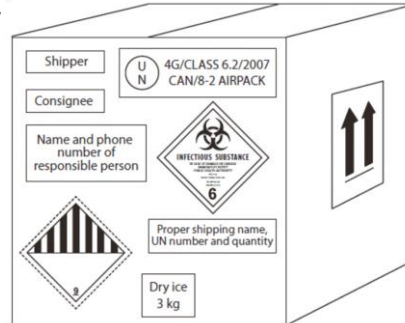
- ☐ Stabilize and dispose
- ☐ Reuse
- ☐ Ignore
- ☐ Recap

Section 6

Specimen Handling and Transport (DOT 49 CFR; IATA DGR; CLIA 42 CFR 493.1103; CAP GEN.40100)

34

I know the proper labeling and packaging requirements for Category (sendouts). *



ents

No Knowledge: I am not familiar with this safety requirement/ practice.

Basic Awareness: I have heard of it but would not feel confident applying it without guidance.

Working Knowledge: I can usually apply this requirement/ practice with occasional help or reminders.

Proficient: I understand and consistently apply this requirement/ practice independently.

Expert/Mentor: I have in-depth knowledge and could train or mentor others on this requirement practice.

My confidence level:

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35

I follow chain-of-custody procedures when required. *

No Knowledge: I am not familiar with this safety requirement/ practice.

Basic Awareness: I have heard of it but would not feel confident applying it without guidance.

Working Knowledge: I can usually apply this requirement/ practice with occasional help or reminders.

Proficient: I understand and consistently apply this requirement/ practice independently.

Expert/Mentor: I have in-depth knowledge and could train or mentor others on this requirement practice.

My confidence level:

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Section 6

No Knowledge: I am not familiar with this safety requirement/ practice.	Basic Awareness: I have heard of it but would not feel confident applying it without guidance.	Working Knowledge: I can usually apply this requirement/ practice with occasional help or reminders.	Proficient: I understand and consistently apply this requirement/ practice independently.	Expert/Mentor: I have in-depth knowledge and could train or mentor others on this requirement practice.
My confidence level: ☐ ☐ ☐ ☐ ☐				

37

Which agency regulates international shipment of infectious specimens? *

☐ IATA ☐ CDC ☐ FDA ☐ OSHA

38

A specimen leaks during pneumatic tube transport. What is your first action? *

☐ Notify supervisor and follow spill protocol ☐ Clean up immediately
☐ Continue transport and clean up after

Section 7

Chemical Hygiene and Hazard Communication (OSHA 29 CFR 1910.1450/1200; NFPA 704; EPA RCRA; CLSI GP17)

39

I am familiar with OSHA's Hazard Communication Standard. *

No Knowledge: I am not familiar with this safety requirement/ practice.	Basic Awareness: I have heard of it but would not feel confident applying it without guidance.	Working Knowledge: I can usually apply this requirement/ practice with occasional help or reminders.	Proficient: I understand and consistently apply this requirement/ practice independently.	Expert/Mentor: I have in-depth knowledge and could train or mentor others on this requirement practice.
My confidence level:	☐	☐	☐	☐

40

I know how to locate safety data sheets for all chemicals used and stored in the laboratory. *

No Knowledge: I am not familiar with this safety requirement/ practice.	Basic Awareness: I have heard of it but would not feel confident applying it without guidance.	Working Knowledge: I can usually apply this requirement/ practice with occasional help or reminders.	Proficient: I understand and consistently apply this requirement/ practice independently.	Expert/Mentor: I have in-depth knowledge and could train or mentor others on this requirement practice.
My confidence level:	☐	☐	☐	☐

41

I know how to read and understand a chemical safety data sheet. *

No Knowledge: I am not familiar with this safety requirement/ practice.	Basic Awareness: I have heard of it but would not feel confident applying it without guidance.	Working Knowledge: I can usually apply this requirement/ practice with occasional help or reminders.	Proficient: I understand and consistently apply this requirement/ practice independently.	Expert/Mentor: I have in-depth knowledge and could train or mentor others on this requirement practice.
My confidence level:	☐	☐	☐	☐

Section 7



No Knowledge: I am not familiar with this safety requirement/ practice.

Basic Awareness: I have heard of it but would not feel confident applying it without guidance.

Working Knowledge: I can usually apply this requirement/ practice with occasional help or reminders.

Proficient: I understand and consistently apply this requirement/ practice independently.

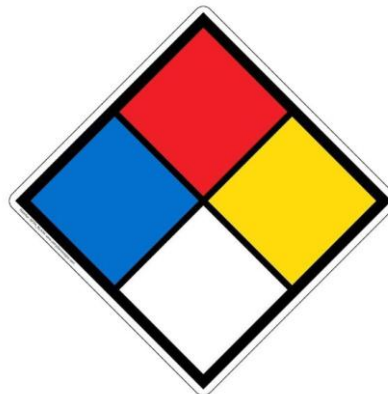
Expert/Mentor: I have in-depth knowledge and could train or mentor others on this requirement practice.

My confidence level:



43

I can interpret NFPA 704 diamond chemical hazards. *



No Knowledge: I am not familiar with this safety requirement/ practice.

Basic Awareness: I have heard of it but would not feel confident applying it without guidance.

Working Knowledge: I can usually apply this requirement/ practice with occasional help or reminders.

Proficient: I understand and consistently apply this requirement/ practice independently.

Expert/Mentor: I have in-depth knowledge and could train or mentor others on this requirement practice.

My confidence level:



I know how to respond to chemical spills safely. *

No Knowledge: I am not familiar with this safety requirement/ practice.

Basic Awareness: I have heard of it but would not feel confident applying it without guidance.

Working Knowledge: I can usually apply this requirement/ practice with occasional help or reminders.

Proficient: I understand and consistently apply this requirement/ practice independently.

Expert/Mentor: I have in-depth knowledge and could train or mentor others on this requirement practice.

My confidence level:

☐
☐
☐
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☐

45

Which OSHA Standard requires laboratories to have a Chemical Hygiene Plan? *

☐ 29 CFR 1910.1450

☐ 29 CFR 1910.120

☐ 29 CFR 1910.134

46

You find an unlabeled bottle of clear liquid in the lab. What should you do? *

☐ Isolate and report

☐ Dispose of down the sink

☐ Smell it to determine if it is water ☐ Label it

Waste Management and Spill Response (EPA RCRA 40 CFR 261; OSHA 29 CFR 1910.120; DOT 49 CFR; TJC EC.02.02.01)

47

I know the definitions of regulated medical waste. *

No Knowledge: I am not familiar with this safety requirement/ practice.	Basic Awareness: I have heard of it but would not feel confident applying it without guidance.	Working Knowledge: I can usually apply this requirement/ practice with occasional help or reminders.	Proficient: I understand and consistently apply this requirement/ practice independently.	Expert/Mentor: I have in-depth knowledge and could train or mentor others on this requirement practice.
My confidence level:	☐	☐	☐	☐

48

I can correctly segregate chemical and biological wastes for disposal. *

No Knowledge: I am not familiar with this safety requirement/ practice.	Basic Awareness: I have heard of it but would not feel confident applying it without guidance.	Working Knowledge: I can usually apply this requirement/ practice with occasional help or reminders.	Proficient: I understand and consistently apply this requirement/ practice independently.	Expert/Mentor: I have in-depth knowledge and could train or mentor others on this requirement practice.
My confidence level:	☐	☐	☐	☐

49

I understand hazardous material spill clean-up procedures for my facility. *

No Knowledge: I am not familiar with this safety requirement/ practice.	Basic Awareness: I have heard of it but would not feel confident applying it without guidance.	Working Knowledge: I can usually apply this requirement/ practice with occasional help or reminders.	Proficient: I understand and consistently apply this requirement/ practice independently.	Expert/Mentor: I have in-depth knowledge and could train or mentor others on this requirement practice.
My confidence level:	☐	☐	☐	☐

Which container color is typically used for biohazardous sharps? *

- ☐ Red
- ☐ Yellow
- ☐ Blue
- ☐ Clear

51

A coworker pours xylene waste into a biohazard container. What is your response? *

- ☐ Correct and document
- ☐ Nothing - this is acceptable.

52

I know the function and maintenance requirements of biosafety cabinets. *

No Knowledge: I am not familiar with this safety requirement/ practice.	Basic Awareness: I have heard of it but would not feel confident applying it without guidance.	Working Knowledge: I can usually apply this requirement/ practice with occasional help or reminders.	Proficient: I understand and consistently apply this requirement/ practice independently.	Expert/Mentor: I have in-depth knowledge and could train or mentor others on this requirement practice.
My confidence level:	☐	☐	☐	☐

53

I know how to verify if a biosafety cabinet is working prior to my work session. *

No Knowledge: I am not familiar with this safety requirement/ practice.	Basic Awareness: I have heard of it but would not feel confident applying it without guidance.	Working Knowledge: I can usually apply this requirement/ practice with occasional help or reminders.	Proficient: I understand and consistently apply this requirement/ practice independently.	Expert/Mentor: I have in-depth knowledge and could train or mentor others on this requirement practice.
My confidence level:	☐	☐	☐	☐

54

I can apply proper work practices in a biosafety cabinet (no arm movement in and out of the cabinet, working 4-6 inches back from the front, working clean to dirty left to right, disinfecting the cabinet at the end of each work session, letting the cabinet power on for 5 minutes before starting work, etc.). *

No Knowledge: I am not familiar with this safety requirement/ practice.	Basic Awareness: I have heard of it but would not feel confident applying it without guidance.	Working Knowledge: I can usually apply this requirement/ practice with occasional help or reminders.	Proficient: I understand and consistently apply this requirement/ practice independently.	Expert/Mentor: I have in-depth knowledge and could train or mentor others on this requirement practice.
My confidence level:	☐	☐	☐	☐

I know the function and maintenance requirements of fume hoods for chemical safety. *

No Knowledge: I am not familiar with this safety requirement/ practice.	Basic Awareness: I have heard of it but would not feel confident applying it without guidance.	Working Knowledge: I can usually apply this requirement/ practice with occasional help or reminders.	Proficient: I understand and consistently apply this requirement/ practice independently.	Expert/Mentor: I have in-depth knowledge and could train or mentor others on this requirement practice.
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My confidence level:

☐
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☐

56

I can apply proper work practices in a fume hood. *

No Knowledge: I am not familiar with this safety requirement/ practice.	Basic Awareness: I have heard of it but would not feel confident applying it without guidance.	Working Knowledge: I can usually apply this requirement/ practice with occasional help or reminders.	Proficient: I understand and consistently apply this requirement/ practice independently.	Expert/Mentor: I have in-depth knowledge and could train or mentor others on this requirement practice.
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My confidence level:

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☐

Equipment and Instrument Safety (OSHA 29 CFR 1910 Subpart O; CLIA 42 CFR 493.1252; FDA)

57

I follow manufacturer instructions for laboratory equipment. *

No Knowledge: I am not familiar with this safety requirement/ practice.	Basic Awareness: I have heard of it but would not feel confident applying it without guidance.	Working Knowledge: I can usually apply this requirement/ practice with occasional help or reminders.	Proficient: I understand and consistently apply this requirement/ practice independently.	Expert/Mentor: I have in-depth knowledge and could train or mentor others on this requirement practice.
My confidence level:	☐	☐	☐	☐

58

I can recognize and report equipment malfunctions. *

No Knowledge: I am not familiar with this safety requirement/ practice.	Basic Awareness: I have heard of it but would not feel confident applying it without guidance.	Working Knowledge: I can usually apply this requirement/ practice with occasional help or reminders.	Proficient: I understand and consistently apply this requirement/ practice independently.	Expert/Mentor: I have in-depth knowledge and could train or mentor others on this requirement practice.
My confidence level:	☐	☐	☐	☐

59

I understand lockout/tagout procedures for maintenance of energized equipment. *

No Knowledge: I am not familiar with this safety requirement/ practice.	Basic Awareness: I have heard of it but would not feel confident applying it without guidance.	Working Knowledge: I can usually apply this requirement/ practice with occasional help or reminders.	Proficient: I understand and consistently apply this requirement/ practice independently.	Expert/Mentor: I have in-depth knowledge and could train or mentor others on this requirement practice.
My confidence level:	☐	☐	☐	☐

Section 11

Ergonomics (NIOSH; OSHA General Duty Clause)

60

I know common ergonomic hazards in the laboratory. *

No Knowledge: I am not familiar with this safety requirement/ practice.	Basic Awareness: I have heard of it but would not feel confident applying it without guidance.	Working Knowledge: I can usually apply this requirement/ practice with occasional help or reminders.	Proficient: I understand and consistently apply this requirement/ practice independently.	Expert/Mentor: I have in-depth knowledge and could train or mentor others on this requirement practice.

61

I apply ergonomic best practices in daily work. These may include, but are not limited to: maintaining neutral posture, keeping items within comfortable reach, using adjustable furniture, taking frequent short breaks to avoid fatigue and strain, minimizing forceful motions and contact stress, rotating tasks, alternating between sitting and standing, etc. *

No Knowledge: I am not familiar with this safety requirement/ practice.	Basic Awareness: I have heard of it but would not feel confident applying it without guidance.	Working Knowledge: I can usually apply this requirement/ practice with occasional help or reminders.	Proficient: I understand and consistently apply this requirement/ practice independently.	Expert/Mentor: I have in-depth knowledge and could train or mentor others on this requirement practice.

62

I understand proper lifting and workstation adjustments. *

No Knowledge: I am not familiar with this safety requirement/ practice.	Basic Awareness: I have heard of it but would not feel confident applying it without guidance.	Working Knowledge: I can usually apply this requirement/ practice with occasional help or reminders.	Proficient: I understand and consistently apply this requirement/ practice independently.	Expert/Mentor: I have in-depth knowledge and could train or mentor others on this requirement practice.

Emergency Preparedness (TJC EC.02.03.01; OSHA 29 CFR 1910.38; NFPA 10; CLIA 42 CFR 493.1202)

63

I am familiar with the facility emergency response plan and how to locate it. *

No Knowledge: I am not familiar with this safety requirement/ practice.	Basic Awareness: I have heard of it but would not feel confident applying it without guidance.	Working Knowledge: I can usually apply this requirement/ practice with occasional help or reminders.	Proficient: I understand and consistently apply this requirement/ practice independently.	Expert/Mentor: I have in-depth knowledge and could train or mentor others on this requirement practice.
My confidence level:	☐	☐	☐	☐

64

I know how to locate and operate emergency eyewash and safety shower stations. *

No Knowledge: I am not familiar with this safety requirement/ practice.	Basic Awareness: I have heard of it but would not feel confident applying it without guidance.	Working Knowledge: I can usually apply this requirement/ practice with occasional help or reminders.	Proficient: I understand and consistently apply this requirement/ practice independently.	Expert/Mentor: I have in-depth knowledge and could train or mentor others on this requirement practice.
My confidence level:	☐	☐	☐	☐

65

I know where the nearest fire extinguishers and fire pulls are located. *

No Knowledge: I am not familiar with this safety requirement/ practice.	Basic Awareness: I have heard of it but would not feel confident applying it without guidance.	Working Knowledge: I can usually apply this requirement/ practice with occasional help or reminders.	Proficient: I understand and consistently apply this requirement/ practice independently.	Expert/Mentor: I have in-depth knowledge and could train or mentor others on this requirement practice.
My confidence level:	☐	☐	☐	☐

6
I know where the laboratory muster points (gathering points within the building or outside depending on emergency) and shelter locations are. *

No Knowledge: I am not familiar with this safety requirement/ practice.	Basic Awareness: I have heard of it but would not feel confident applying it without guidance.	Working Knowledge: I can usually apply this requirement/ practice with occasional help or reminders.	Proficient: I understand and consistently apply this requirement/ practice independently.	Expert/Mentor: I have in-depth knowledge and could train or mentor others on this requirement practice.
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My confidence level: ☐ ☐ ☐ ☐ ☐

67
Which type of fire extinguisher is appropriate for electrical fires? *

- ☐ Class A
- ☐ Class B
- ☐ Class C
- ☐ Class K

68
A fire alarm sounds while processing specimens. What is your first action? *

- ☐ Finish task then evacuate
- ☐ Sort specimens for easy task pick up after evacuation
- ☐ Evacuate immediately

69

I am familiar with CLIA personnel competency requirements. *

No Knowledge: I am not familiar with this safety requirement/ practice.	Basic Awareness: I have heard of it but would not feel confident applying it without guidance.	Working Knowledge: I can usually apply this requirement/ practice with occasional help or reminders.	Proficient: I understand and consistently apply this requirement/ practice independently.	Expert/Mentor: I have in-depth knowledge and could train or mentor others on this requirement practice.
My confidence level:	☐	☐	☐	☐

70

I can interpret quality control and proficiency testing results. *

No Knowledge: I am not familiar with this safety requirement/ practice.	Basic Awareness: I have heard of it but would not feel confident applying it without guidance.	Working Knowledge: I can usually apply this requirement/ practice with occasional help or reminders.	Proficient: I understand and consistently apply this requirement/ practice independently.	Expert/Mentor: I have in-depth knowledge and could train or mentor others on this requirement practice.
My confidence level:	☐	☐	☐	☐

71

I understand documentation requirements for accreditation. *

No Knowledge: I am not familiar with this safety requirement/ practice.	Basic Awareness: I have heard of it but would not feel confident applying it without guidance.	Working Knowledge: I can usually apply this requirement/ practice with occasional help or reminders.	Proficient: I understand and consistently apply this requirement/ practice independently.	Expert/Mentor: I have in-depth knowledge and could train or mentor others on this requirement practice.
My confidence level:	☐	☐	☐	☐

7
Which federal regulation contains CLIA requirements for clinical laboratories? *

- ☐ 42 CFR 493
- ☐ OSHA 1910
- ☐ FDA 21 CFR
- ☐ CAP GEN

73
You notice a failed QC and your supervisor is not immediately available. What should you do? *

- ☐ Hold testing until QC is resolved
- ☐ Continue testing and notify your supervisor

74
I am familiar with the following accreditations/certifications for clinical labs: *

- ☐ CLIA
- ☐ CAP
- ☐ The Joint Commission
- ☐ COLA
- ☐ AABB
- ☐ ISO 15189
- ☐ APHL/CDC Laboratory Accreditation Program
- ☐ ISO/IEC 17025

Information Security and Privacy (HIPAA 45 CFR 164; HITECH; TJC IM.02.01.01)

75

I understand HIPAA Privacy Rules as applied to lab data. *

No Knowledge: I am not familiar with this safety requirement/ practice.	Basic Awareness: I have heard of it but would not feel confident applying it without guidance.	Working Knowledge: I can usually apply this requirement/ practice with occasional help or reminders.	Proficient: I understand and consistently apply this requirement/ practice independently.	Expert/Mentor: I have in-depth knowledge and could train or mentor others on this requirement practice.
My confidence level:	☐	☐	☐	☐

76

I handle specimens and data in compliance with HIPAA regulations. *

No Knowledge: I am not familiar with this safety requirement/ practice.	Basic Awareness: I have heard of it but would not feel confident applying it without guidance.	Working Knowledge: I can usually apply this requirement/ practice with occasional help or reminders.	Proficient: I understand and consistently apply this requirement/ practice independently.	Expert/Mentor: I have in-depth knowledge and could train or mentor others on this requirement practice.
My confidence level:	☐	☐	☐	☐

77

I follow facility and agency cybersecurity protocols. *

No Knowledge: I am not familiar with this safety requirement/ practice.	Basic Awareness: I have heard of it but would not feel confident applying it without guidance.	Working Knowledge: I can usually apply this requirement/ practice with occasional help or reminders.	Proficient: I understand and consistently apply this requirement/ practice independently.	Expert/Mentor: I have in-depth knowledge and could train or mentor others on this requirement practice.
My confidence level:	☐	☐	☐	☐

You notice a coworker is still logged in on the laboratory system. What should you do? *

- ☐ Log out and remind them to log out when ending a work session

I have a working relationship with organizational safety leadership. *

Strongly Agree Agree Neutral Disagree Strongly Disagree

My confidence level: ☐ ☐ ☐ ☐ ☐

79

I am familiar with my facility's safety reporting system. *

No Knowledge: I am not familiar with this safety requirement/ practice.	Basic Awareness: I have heard of it but would not feel confident applying it without guidance.	Working Knowledge: I can usually apply this requirement/ practice with occasional help or reminders.	Proficient: I understand and consistently apply this requirement/ practice independently.	Expert/Mentor: I have in-depth knowledge and could train or mentor others on this requirement practice.
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My confidence level: ☐ ☐ ☐ ☐ ☐

80

I know which safety items and concerns to report and when to report them. *

No Knowledge: I am not familiar with this safety requirement/ practice.	Basic Awareness: I have heard of it but would not feel confident applying it without guidance.	Working Knowledge: I can usually apply this requirement/ practice with occasional help or reminders.	Proficient: I understand and consistently apply this requirement/ practice independently.	Expert/Mentor: I have in-depth knowledge and could train or mentor others on this requirement practice.
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My confidence level: ☐ ☐ ☐ ☐ ☐

81

I am comfortable speaking up about safety concerns. *

Strongly Agree Agree Neutral Disagree Strongly Disagree

My confidence level: ☐ ☐ ☐ ☐ ☐

82

I understand my role in fostering a positive safety culture. *

Strongly Agree Agree Neutral Disagree Strongly Disagree

My confidence level: ☐ ☐ ☐ ☐ ☐

Strongly Agree Agree Neutral Disagree Strongly Disagree

My confidence level:

☐ ☐ ☐ ☐ ☐

84
My safety concerns will be taken seriously. *

Strongly Agree Agree Neutral Disagree Strongly Disagree

My confidence level:

☐ ☐ ☐ ☐ ☐

85
Please describe any safety topics you would like additional training and information provided for. These topics may be ones from this survey or additional ones that were not described here. This information will help guide the development of a self-paced, voluntary safety course. Thank you for your honest answers and participation. *

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Appendix 2

Safety Fact Sheet

Bloodborne Pathogens and Laboratory Biosafety

Introduction

Bloodborne pathogens, including HIV, HBV, and HCV, can be transmitted via exposure to blood and certain body fluids. Laboratories must implement engineering controls, PPE, safe work practices, and post-exposure procedures to minimize risk. Biosafety levels (BSL) define containment requirements for microorganisms.



What you need to know:



Personal Protective Equipment

Always wear personal protective equipment while working with or around hazardous materials, including a laboratory coat, gloves, and eye protection.



Sharps Safety

Follow proper sharps handling and disposal. Do not recap needles. Always dispose of needles in a designated sharps container. Know the post-exposure protocol and report exposures immediately.



Microbiological Practices

Understand the biosafety level of the laboratory (BSL-2) and use good microbiological practices to reduce aerosols and risk of infection.



Use a Biosafety Cabinet

When working with human blood or body fluids (other potentially infectious materials (OPIM)), work inside a biosafety cabinet when conducting aerosol producing procedures, including pipetting and opening of centrifuged tubes.



Practice Proactive Hand Hygiene

Wash hands immediately after exposure or when removing gloves. Wash hands before leaving the laboratory. Wash hands for at least 20 seconds.



Safety Eyewash Activation

In case of eye exposure to blood or other potentially infectious materials (OPIM), immediately go to the nearest eyewash station. Flush eyes with running water for 15 minutes minimum. Report the incident immediately to a supervisor.

References

OSHA 29 CFR 1910.1030 – Bloodborne Pathogen Standard
CDC BMBL, 6th Edition
CLSI M29
CLIA 42 CFR 493.1105

Safety Fact Sheet

Specimen Collection and Phlebotomy Safety

Introduction

Proper specimen collection prevents patient misidentification, contamination, and exposure risk. Phlebotomists and lab staff must follow correct order-of-draw, labeling at bedside, and infection control procedures.



What you need to know:



Personal Protective Equipment

Always wear personal protective equipment while collecting specimens, including gloves, protective clothing, and eye protection. Treat all specimens as infectious.



Sharps Safety

Follow proper sharps handling and disposal. Do not recap needles. Always dispose of needles in a designated sharps container. Know the post-exposure protocol and report exposures immediately.



Patient Identification and Labelling

Always use two patient identifiers for all specimen collections. Label specimens at the bedside, immediately after collection in the presence of the patient.



Order of Draw

Follow the correct order-of-draw to prevent cross-contamination: blood cultures, citrate (blue), serum (red and gold), heparin (green), EDTA (lavendar), and glycolytic inhibitor tubes (gray).



Practice Proactive Hand Hygiene

Wash hands immediately after exposure or when removing gloves. Wash hands before leaving the laboratory. Wash hands for at least 20 seconds.

Safety Eyewash Activation

In case of eye exposure to blood or other potentially infectious materials (OPIM), immediately go to the nearest eyewash station. Flush eyes with running water for 15 minutes minimum. Report the incident immediately to a supervisor.



References

OSHA 29 CFR 1910.1030 – Bloodborne Pathogen Standard
CDC BMBL, 6th Edition
CLSI M29
CLIA 42 CFR 493.1105

Safety Fact Sheet

Personal Protective Equipment (PPE) & Hand Hygiene

Introduction

Proper use of PPE and hand hygiene are critical to preventing laboratory-acquired infections. PPE must be selected based on the task, and hand hygiene must be performed consistently.

What you need to know:



Personal Protective Equipment

Always wear personal protective equipment while working with or around hazardous materials. This includes eye protection, hand protection, and body protection.



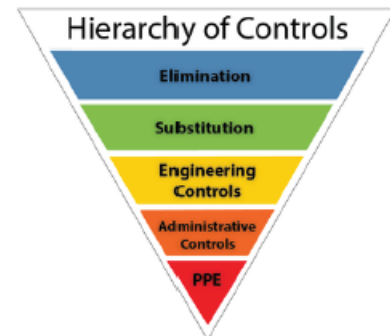
Risk Assessment

Personal protective equipment is selected based on risks of exposure, routes of exposure, and consequences of exposure. Always wear designated PPE to reduce your personal risk.



Donning and Doffing Matters

Don and doff PPE in the correct sequence to minimize risk of contamination and exposure. Don: lab coat, respiratory protection (if required), safety glasses, gloves. Doff: gloves, gown, safety glasses, respiratory protection (if required).



Practice Proactive Hand Hygiene

Wash hands immediately after exposure or when removing gloves. Wash hands before leaving the laboratory. Wash hands for at least 20 seconds.



Replace PPE

Replace PPE when it becomes damaged or contaminated. Do not rely on PPE to protect you once it is compromised or dirty. Remember, PPE is the least effective control measure for preventing exposure. Use PPE in combination with engineering controls and administrative controls. Always follow laboratory procedures and use equipment in accordance with manufacturer specifications.

References

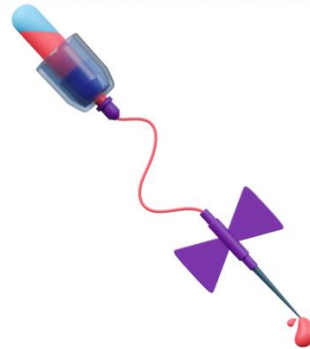
OSHA 29 CFR 1910.1030 – Bloodborne Pathogen Standard
CDC BMBL, 6th Edition
CLSI M29
CLIA 42 CFR 493.1105

Safety Fact Sheet

Needlestick Injury: Immediate Steps

Introduction

Needlestick injuries can occur even during routine phlebotomy, and rapid, correct action is essential to protect staff health and ensure compliance with hospital safety standards. This reminder outlines the immediate steps every team member must follow after any sharps exposure. Review these procedures regularly and follow them without delay to support a safe working environment in the draw station.



What you need to know:



1. Stop Work Immediately

Remove yourself from the task to prevent additional exposure.

2. Wash the Injury Site

Wash with soap and water for at least 20 seconds. Do NOT squeeze, scrub vigorously, or use bleach or harsh chemicals.



3. Report the Exposure

Report injury to supervisor. If supervisor is unavailable, report injury to laboratory manager. All needlestick injuries must be reported regardless if the needle was clean or used.

4. Seek Medical Evaluation with ER

Seek medical evaluation through the Emergency Department as directed by hospital protocol. Bringing information about the source patient, the device involved, and how the injury occurred.



5. Attend Required Follow-up Exams

Follow post-exposure management instructions, which may include baseline labs, source testing with consent, prophylaxis for HIV or hepatitis B when indicated, and scheduled follow-up testing.

Appendix 3

Survey Section / Domain	Regulatory Body / Standard	Citation / Reference	Scope / Purpose
Biosafety & Bloodborne Pathogens	OSHA	29 CFR 1910.1030	Bloodborne Pathogen Standard – exposure prevention, PPE, training, post-exposure protocols
	CDC	BMBL (Biosafety in Microbiological and Biomedical Laboratories)	Lab biosafety levels, engineering and administrative controls
	CLSI	M29	Bloodborne pathogens and safety practices
	CLIA	42 CFR 493.1105	Lab personnel and safety requirements
Specimen Collection & Phlebotomy	CLSI	GP41	Venipuncture procedures, order of draw, collection practices
	OSHA	29 CFR 1910.1030	Bloodborne pathogen exposure prevention
	TJC	NPSG.01.01.01	Two patient identifiers to prevent misidentification
	CLIA	42 CFR 493.1252	Specimen labeling and handling standards
PPE & Hand Hygiene	OSHA	29 CFR 1910.132/.133/.134	PPE requirements, respirator use
	CDC	Hand Hygiene Guidelines	Handwashing and sanitizing best practices
	TJC	IC.02.01.01	Infection control standards

Survey Section / Domain	Regulatory Body / Standard	Citation / Reference	Scope / Purpose
Sharps Safety	OSHA	29 CFR 1910.1030(d)(2)	Engineering controls for sharps and disposal
	NIOSH	Bloodborne pathogen safety guidance	Sharps handling, prevention of injury
	FDA	Medical device regulations	Safety-engineered devices and sharps
Specimen Handling & Transport	DOT	49 CFR	Transport of hazardous and infectious materials
	IATA	Dangerous Goods Regulations (DGR)	International shipment of infectious substances
	CLIA	42 CFR 493.1103	Specimen transport and chain-of-custody
	CAP	GEN.40100	Accreditation requirements for specimen handling
Chemical Hygiene & Hazard Communication	OSHA	29 CFR 1910.1450	Chemical Hygiene Plan
	OSHA	29 CFR 1910.1200	Hazard Communication Standard
	NFPA	704	Chemical labeling (flammability, reactivity, health hazards)
	EPA	RCRA	Hazardous chemical waste management
	CLSI	GP17	Chemical safety in the lab

Survey Section / Domain	Regulatory Body / Standard	Citation / Reference	Scope / Purpose
Waste Management & Spill Response	EPA	40 CFR 261	Definition and management of regulated medical waste
	OSHA	29 CFR 1910.120	Hazardous waste operations & emergency response
	DOT	49 CFR	Hazardous materials transport
	TJC	EC.02.02.01	Emergency management standards for spills
Engineering Controls	OSHA	29 CFR 1910.1030	Bloodborne pathogen engineering controls (BSCs, sharps)
	CDC	BMBL	Biosafety cabinet practices, containment levels
	CLSI	M29	Laboratory safety engineering guidance
Equipment & Instrument Safety	OSHA	29 CFR 1910 Subpart O	Equipment safety, machine guarding
	CLIA	42 CFR 493.1252	Equipment maintenance, calibration, and QC
	FDA	Medical device regulations	Safe use of lab instruments
Ergonomics	NIOSH	–	Ergonomic hazards, workstation setup, lifting
	OSHA	General Duty Clause	Employer responsibility for safe workplace conditions

Survey Section / Domain	Regulatory Body / Standard	Citation / Reference	Scope / Purpose
Emergency Preparedness	TJC	EC.02.03.01	Emergency preparedness and response in hospitals
	OSHA	29 CFR 1910.38	Emergency action plan standard
	NFPA	10	Fire extinguisher classification and use
	CLIA	42 CFR 493.1202	Lab emergency preparedness standards
Radiation & Lasers	NRC	10 CFR Part 20	Radiation protection and dose limits
	OSHA	29 CFR 1910.1096	Ionizing radiation standards
	ANSI	Z136	Laser safety standards
Quality Systems & Accreditation	CLIA	42 CFR 493	Lab personnel, QC, proficiency testing, documentation
	CAP	GEN	Quality and accreditation standards
	TJC	Laboratory standards	Quality and patient safety requirements
	CMS	CLIA oversight	Compliance with federal regulations
	ISO	15189	International lab quality and competence standards
Information Security & Privacy	HIPAA	45 CFR 164	Patient privacy and health data protection

Survey Section / Domain	Regulatory Body / Standard	Citation / Reference	Scope / Purpose
Communication & Safety Culture	HITECH	–	Electronic health record privacy and security
	TJC	IM.02.01.01	Information management standards for patient data
	OSHA	29 CFR 1904	Recording and reporting workplace injuries
	TJC	LD.03.01.01	Leadership, accountability, and culture of safety
	ASCP / AMT	Code of Ethics	Professional ethical standards and safe practice
Role-Specific Safety Items	Various	FACT, ASHI, CAP subspecialty	Standards for stem cells, histocompatibility, BSL2/3 labs

Appendix 4

Clinical Laboratory Safety Knowledge & Competency Survey Comprehensive Report

Prepared on Oct 15, 2025
Report was written by Brian Weiderman, MHA, MLS(AMT)
for IACH Laboratory Leadership

Executive Summary

Responses: 12 completed surveys.

Scope: Survey contained 52 competency/knowledge questions covering biosafety, bloodborne pathogens, specimen handling, CLIA/QC, chemical hygiene/spill response, HIPAA/data protections, ergonomics, emergency response, and safety culture/reporting.

Overview of Results: Respondents show moderate to high confidence in many technical and regulatory topics including proper instrument usage, PPE usage, eyewash knowledge, and HIPAA compliance. The survey showed individuals had lower confidence in patient-identification procedure, specimen labeling practices, in-lab sample transport, SDS knowledge, and several safety-culture items.

Recommendation: Start with targeted retraining on specimen identification & transport, SDS introduction, and stress safety culture with reporting behaviors. Complement with quick refreshers on HIPAA lab data handling and standardized specimen labeling practices.

Limitations: Small sample size limits statistical inference. Some items had missing data. Survey encompassed all skill level and roles of laboratory operations leading to wider responses.

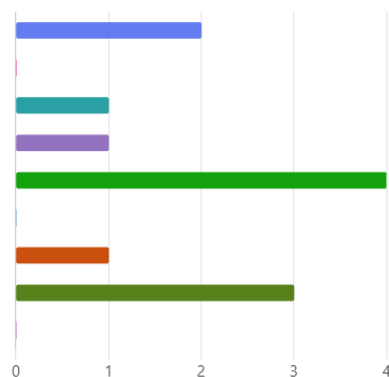
Quantitative Overview / Results

Participant Summary

Number of participants: 12

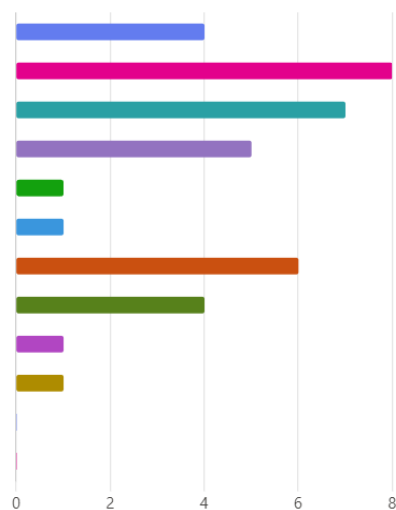
Lab roles:

Phlebotomist	2
Laboratory Assistant	0
Laboratory Technician (MLT)	1
Laboratory Technologist (MLS)	1
Laboratory Section Supervisor/ MLS	4
Pathologist	0
Laboratory Leadership (Manager)	1
Student/ Intern	3
Other	0



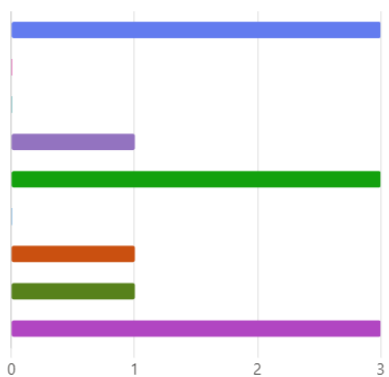
Current work areas:

Microbiology	4
Hematology/ Coagulation Studies	8
Chemistry	7
Blood Bank/ Transfusion Medicine	5
Anatomic Pathology	1
Molecular	1
Urinalysis	6
Patient Services (Phlebotomy/shipping/processing)	4
Point-of-Care	1
Management/Leadership Broad Laboratory Oversight	1
Other	0



Years of Experience:

0-1	3
2-3	0
3-4	0
4-5	1
5-6	3
6-10	0
10-15	1
15-20	1
21+	3



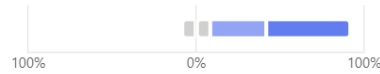
Top Strengths

• Following manufacturer instructions for laboratory instruments.

55. I follow manufacturer instructions for laboratory equipment.

- No Knowledge: I am not familiar with this safety requirement/ practice.
- Basic Awareness: I have heard of it but would not feel confident applying it without guidance.
- Working Knowledge: I can usually apply this requirement/ practice with occasional help or reminders.
- Proficient: I understand and consistently apply this requirement/ practice independently.
- Expert/Mentor: I have in-depth knowledge and could train or mentor others on this requirement practice.

My confidence level:

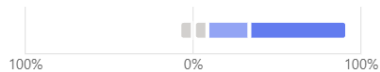


• Familiarity with PPE.

23. I can correctly don and doff PPE to prevent contamination.

- No Knowledge: I am not familiar with this safety requirement/ practice.
- Basic Awareness: I have heard of it but would not feel confident applying it without guidance.
- Working Knowledge: I can usually apply this requirement/ practice with occasional help or reminders.
- Proficient: I understand and consistently apply this requirement/ practice independently.
- Expert/Mentor: I have in-depth knowledge and could train or mentor others on this requirement practice.

My confidence level:

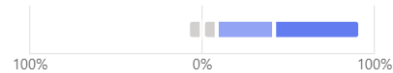


• Emergency eyewash operation.

62. I know how to locate and operate emergency eyewash and safety shower stations.

- No Knowledge: I am not familiar with this safety requirement/ practice.
- Basic Awareness: I have heard of it but would not feel confident applying it without guidance.
- Working Knowledge: I can usually apply this requirement/ practice with occasional help or reminders.
- Proficient: I understand and consistently apply this requirement/ practice independently.
- Expert/Mentor: I have in-depth knowledge and could train or mentor others on this requirement practice.

My confidence level:

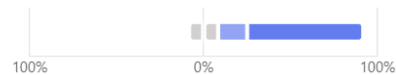


• HIPAA regulations.

73. I handle specimens and data in compliance with HIPAA regulations.

- No Knowledge: I am not familiar with this safety requirement/ practice.
- Basic Awareness: I have heard of it but would not feel confident applying it without guidance.
- Working Knowledge: I can usually apply this requirement/ practice with occasional help or reminders.
- Proficient: I understand and consistently apply this requirement/ practice independently.
- Expert/Mentor: I have in-depth knowledge and could train or mentor others on this requirement practice.

My confidence level:



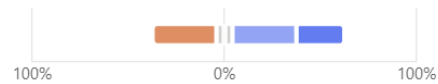
Top Gaps

• Knowledge of steps to take after a bloodborne pathogen exposure

16. I know the proper steps to take after a bloodborne pathogens exposure.

- No Knowledge: I am not familiar with this safety requirement/ practice.
- Basic Awareness: I have heard of it but would not feel confident applying it without guidance.
- Working Knowledge: I can usually apply this requirement/ practice with occasional help or reminders.
- Proficient: I understand and consistently apply this requirement/ practice independently.
- Expert/Mentor: I have in-depth knowledge and could train or mentor others on this requirement practice.

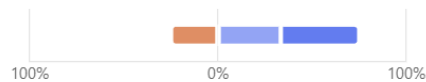
My confidence level:



29. I understand what to do after a needlestick injury.

- No Knowledge: I am not familiar with this safety requirement/ practice.
- Basic Awareness: I have heard of it but would not feel confident applying it without guidance.
- Working Knowledge: I can usually apply this requirement/ practice with occasional help or reminders.
- Proficient: I understand and consistently apply this requirement/ practice independently.
- Expert/Mentor: I have in-depth knowledge and could train or mentor others on this requirement practice.

My confidence level:

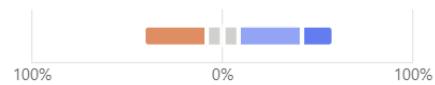


• Waste management.

45. I know the definitions of regulated medical waste.

- No Knowledge: I am not familiar with this safety requirement/ practice.
- Basic Awareness: I have heard of it but would not feel confident applying it without guidance.
- Working Knowledge: I can usually apply this requirement/ practice with occasional help or reminders.
- Proficient: I understand and consistently apply this requirement/ practice independently.
- Expert/Mentor: I have in-depth knowledge and could train or mentor others on this requirement practice.

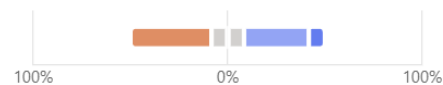
My confidence level:



46. I can correctly segregate chemical and biological wastes for disposal.

- No Knowledge: I am not familiar with this safety requirement/ practice.
- Basic Awareness: I have heard of it but would not feel confident applying it without guidance.
- Working Knowledge: I can usually apply this requirement/ practice with occasional help or reminders.
- Proficient: I understand and consistently apply this requirement/ practice independently.
- Expert/Mentor: I have in-depth knowledge and could train or mentor others on this requirement practice.

My confidence level:

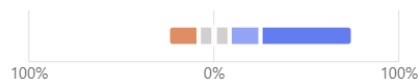


• Ability to interpret safety data sheets and chemical hazards.

39. I know how to read and understand a chemical safety data sheet.

- No Knowledge: I am not familiar with this safety requirement/ practice.
- Basic Awareness: I have heard of it but would not feel confident applying it without guidance.
- Working Knowledge: I can usually apply this requirement/ practice with occasional help or reminders.
- Proficient: I understand and consistently apply this requirement/ practice independently.
- Expert/Mentor: I have in-depth knowledge and could train or mentor others on this requirement practice.

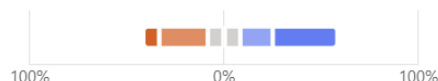
My confidence level:



40. I can interpret GHS Pictograms.

- No Knowledge: I am not familiar with this safety requirement/ practice.
- Basic Awareness: I have heard of it but would not feel confident applying it without guidance.
- Working Knowledge: I can usually apply this requirement/ practice with occasional help or reminders.
- Proficient: I understand and consistently apply this requirement/ practice independently.
- Expert/Mentor: I have in-depth knowledge and could train or mentor others on this requirement practice.

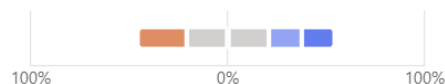
My confidence level:



41. I can interpret NFPA 704 diamond chemical hazards.

- No Knowledge: I am not familiar with this safety requirement/ practice.
- Basic Awareness: I have heard of it but would not feel confident applying it without guidance.
- Working Knowledge: I can usually apply this requirement/ practice with occasional help or reminders.
- Proficient: I understand and consistently apply this requirement/ practice independently.
- Expert/Mentor: I have in-depth knowledge and could train or mentor others on this requirement practice.

My confidence level:

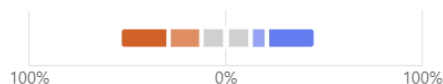


• Knowledge of biosafety cabinets and fume hoods.

15. I can correctly use a biosafety cabinet according to CDC BMBL guidelines.

- No Knowledge: I am not familiar with this safety requirement/ practice.
- Basic Awareness: I have heard of it but would not feel confident applying it without guidance.
- Working Knowledge: I can usually apply this requirement/ practice with occasional help or reminders.
- Proficient: I understand and consistently apply this requirement/ practice independently.
- Expert/Mentor: I have in-depth knowledge and could train or mentor others on this requirement practice.

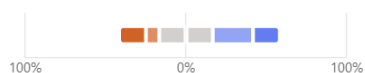
My confidence level:



50. I know the function and maintenance requirements of biosafety cabinets.

- No Knowledge: I am not familiar with this safety requirement/ practice.
- Basic Awareness: I have heard of it but would not feel confident applying it without guidance.
- Working Knowledge: I can usually apply this requirement/ practice with occasional help or reminders.
- Proficient: I understand and consistently apply this requirement/ practice independently.
- Expert/Mentor: I have in-depth knowledge and could train or mentor others on this requirement practice.

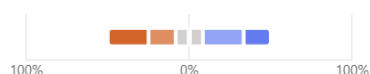
My confidence level:



51. I know how to verify if a biosafety cabinet is working prior to my work session.

- No Knowledge: I am not familiar with this safety requirement/ practice.
- Basic Awareness: I have heard of it but would not feel confident applying it without guidance.
- Working Knowledge: I can usually apply this requirement/ practice with occasional help or reminders.
- Proficient: I understand and consistently apply this requirement/ practice independently.
- Expert/Mentor: I have in-depth knowledge and could train or mentor others on this requirement practice.

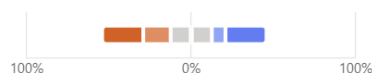
My confidence level:



52. I can apply proper work practices in a biosafety cabinet (no arm movement in and out of the cabinet, working 4-6 inches back from the front, working clean to dirty left to right, disinfecting the cabinet at the end of each work session, letting the cabinet power on for 5 minutes before starting work, etc.). [More details](#)

- No Knowledge: I am not familiar with this safety requirement/ practice.
- Basic Awareness: I have heard of it but would not feel confident applying it without guidance.
- Working Knowledge: I can usually apply this requirement/ practice with occasional help or reminders.
- Proficient: I understand and consistently apply this requirement/ practice independently.
- Expert/Mentor: I have in-depth knowledge and could train or mentor others on this requirement practice.

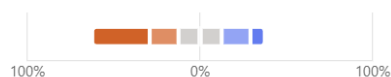
My confidence level:



53. I know the function and maintenance requirements of fume hoods for chemical safety.

- No Knowledge: I am not familiar with this safety requirement/ practice.
- Basic Awareness: I have heard of it but would not feel confident applying it without guidance.
- Working Knowledge: I can usually apply this requirement/ practice with occasional help or reminders.
- Proficient: I understand and consistently apply this requirement/ practice independently.
- Expert/Mentor: I have in-depth knowledge and could train or mentor others on this requirement practice.

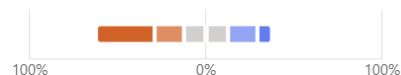
My confidence level:



54. I can apply proper work practices in a fume hood.

- No Knowledge: I am not familiar with this safety requirement/ practice.
- Basic Awareness: I have heard of it but would not feel confident applying it without guidance.
- Working Knowledge: I can usually apply this requirement/ practice with occasional help or reminders.
- Proficient: I understand and consistently apply this requirement/ practice independently.
- Expert/Mentor: I have in-depth knowledge and could train or mentor others on this requirement practice.

My confidence level:

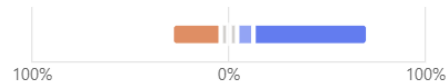


• Patient Identification and error handling.

7. I understand how to respond if there is a patient identification error.

- No Knowledge: I am not familiar with this safety requirement/ practice.
- Basic Awareness: I have heard of it but would not feel confident applying it without guidance.
- Working Knowledge: I can usually apply this requirement/ practice with occasional help or reminders.
- Proficient: I understand and consistently apply this requirement/ practice independently.
- Expert/Mentor: I have in-depth knowledge and could train or mentor others on this requirement practice.

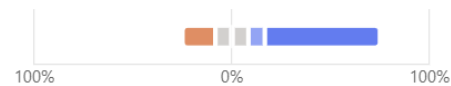
My confidence level:



8. I consistently use two patient identifiers before collecting a specimen.

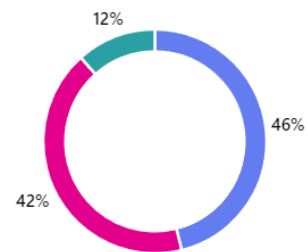
- No Knowledge: I am not familiar with this safety requirement/ practice.
- Basic Awareness: I have heard of it but would not feel confident applying it without guidance.
- Working Knowledge: I can usually apply this requirement/ practice with occasional help or reminders.
- Proficient: I understand and consistently apply this requirement/ practice independently.
- Expert/Mentor: I have in-depth knowledge and could train or mentor others on this requirement practice.

My confidence level:



12. Which of these are acceptable patient identifiers?

- | | |
|-------------------------|----|
| ● Full name | 12 |
| ● Date of birth | 11 |
| ● Medical record number | 3 |
| ● Room number | 0 |



Critical Investigation into Clinical Laboratory Safety Competency Areas

Biosafety & Bloodborne Pathogens

Respondents report reasonably high confidence with biosafety fundamentals but lack knowledge in accident response.

Specimen Collection & Phlebotomy

Responses show a potential issue with proper patient identification, specimen labeling, and knowledge of misidentification procedures.

PPE & Hand Hygiene

All responses showed high confidence and knowledge of PPE and proper hand hygiene.

Sharp Safety

All responses showed high confidence and knowledge of sharp handling, but some respondents showed a lack of knowledge on proper needlestick response.

Specimen Handling & Transportation

Responses showed high confidence in transportation of infectious material; however, few responses demonstrated accurate knowledge of shipping requirements. A few respondents showed little confidence in chain-of-custody knowledge.

Chemical Hygiene & Hazards Communication

Responses showed a need for training in chemical labeling, hazard communication, and SDS interpretation.

Waste Management and Spill Response

Responses showed low knowledge of biological and chemical waste management.

Engineering Controls

Responses showed a need for training in biosafety cabinet and fume cabinet usage and maintenance.

Equipment & Instrument Safety

All responses showed high confidence and knowledge.

Ergonomics

All responses showed high confidence and knowledge.

Emergency Preparedness

All responses showed high confidence and knowledge. One individual requested training on defend-in-place procedure.

Radiation & Lasers

Radiation & laser standards were not a part of this survey.

Quality Assurance & Accreditation

All responses showed high confidence and knowledge.

Information Security & Privacy

All responses showed high confidence and knowledge.

Communication & Safety Culture

All responses showed high confidence and knowledge.

Role Specific Items

All responses showed high confidence and knowledge.

Final Recommendations

1. Biosafety & Bloodborne Pathogens

Identified gap: Lack of knowledge in accident response.

Recommendation:

- Reiterate bloodborne exposure policy and the express importance of exposure response.

2. Specimen Collection & Phlebotomy

Identified gaps: Weaknesses in patient identification, specimen labeling, and misidentification procedures.

Recommendation:

- Implement a targeted competency validation on patient identification using two unique identifiers and correct labeling at bedside.
- Reiterate the procedure for mis-labeled specimen.

3. Sharp Safety

Identified gap: Lack of knowledge on proper needlestick response.

Recommendation:

- Send reminder to all staff about the proper needlestick response.
- Post visual reminders near sharps disposal areas summarizing response steps.

4. Specimen Handling & Transportation

Identified gaps: Uncertainty about infectious material shipping requirements and chain-of-custody procedures.

Recommendation:

- Provide training material on shipping requirements.
- Reinforce chain-of-custody protocols and importance for legal specimens.

5. Chemical Hygiene & Hazard Communication

Identified gaps: Chemical labeling, hazard communication, and SDS interpretation.

Recommendation:

- Conduct an annual Chemical Hygiene Plan refresher with focus on:
 - GHS pictograms and secondary container labeling
 - SDS section interpretation (especially first aid, storage, and disposal)

6. Waste Management & Spill Response

Identified gaps: Low knowledge in biological and chemical waste management.

Recommendation:

- Provide biosafety training covering:
 - Segregation of biological vs. chemical waste

- Proper container use, labeling, and disposal timelines
- Spill response protocols for each waste type

7. Engineering Controls

Identified gaps: Biosafety cabinet (BSC) and fume hood usage and maintenance.

Recommendation:

- Conduct in-lab demonstrations on proper BSC airflow verification, loading patterns, and decontamination.
- Reinforce annual certification awareness and what to do if airflow alarms trigger.
- Provide training material explaining the use of both BSC and fume hood usage.

8. Emergency Preparedness

Identified gap: One request for defend-in-place procedure.

Recommendation:

- Have a defend-in-place discussion during the daily huddle

Appendix 5

Course Overview: Clinical Laboratory Safety Regulations

This course provides a comprehensive orientation to the regulatory frameworks governing safety in the clinical laboratory environment focusing on OSHA, CDC, CLIA, TJC, and CAP regulations. Learners will examine the federal standards, accreditation requirements, and best-practice guidelines that ensure biosafety, chemical hygiene, emergency preparedness, specimen integrity, and patient/staff protection. This course will attempt to apply safety awareness and safety culture into the daily workflow in the clinical laboratory. The curriculum is designed for laboratory personnel of all skill levels.

Learning Objectives

By the end of this course, participants will be able to:

1. **Identify** all major regulatory bodies (OSHA, CDC, CLIA, TJC, CAP, DOT, NRC, FDA, EPA, NIOSH, etc.) and describe their authority and role in laboratory safety compliance.
2. **Interpret** key regulations and standards that govern biosafety, bloodborne pathogens, chemical hygiene, radiation protection, ergonomics, and emergency preparedness.
3. **Apply** the requirements for specimen collection, labeling, transport, and handling in accordance with CLIA, DOT, IATA, and accreditation standards.
4. **Differentiate** between engineering controls, administrative controls, PPE, and work practice controls, and explain their regulatory foundations.
5. **Evaluate** laboratory safety practices for compliance with national and international standards and identify opportunities for improvement.
6. **Develop** readiness for inspections by linking regulations to documentation, competency, training, and quality system requirements.
7. **Demonstrate** an understanding of how safety regulations integrate with information security, ethical expectations, and organizational culture.

Module Breakdown

Module 1 – Introduction to Laboratory Regulatory Framework

Regulators Covered: OSHA, CDC, CLIA, CAP, TJC, CMS, ISO

Key Topics:

- Overview of the U.S. regulatory environment
- Accreditation versus regulation
- The structure of CLIA and CMS oversight
- Role of CAP, TJC, COLA, and ISO 15189
- Hierarchy of laws, regulations, guidance, and standards

Learning Outcome: Learners understand who regulates what and why.

Module 2 – Biosafety & Bloodborne Pathogen Compliance

Regulators: OSHA 1910.1030, CDC BMBL, CLIA, CLSI M29

Key Topics:

- Exposure control plans
- Biosafety levels and engineering controls
- Post-exposure evaluation requirements
- PPE and safe work practices
- Documentation and training intervals

Learning Outcome: Learners apply biosafety and BBP standards to bench-level operations.

Module 3 – Specimen Collection, Labeling & Phlebotomy Safety

Regulators: CLSI GP41, OSHA BBP, CLIA 493.1252, TJC NPSG 01.01.01

Key Topics:

- Order of draw and venipuncture standards
- Patient identification and misidentification prevention
- Specimen labeling requirements

- Impact of preanalytical errors on patient safety

Learning Outcome: Learners demonstrate compliant specimen collection and labeling processes.

Module 4 – PPE, Hand Hygiene & Infection Control Standards

Regulators: OSHA PPE standards, CDC Hand Hygiene Guidelines, TJC IC standards

Key Topics:

- Required PPE by hazard type
- Respiratory protection and fit testing
- Proper hand hygiene technique
- Infection prevention and exposure minimization

Learning Outcome: Learners correctly implement PPE and hygiene standards aligned with regulation.

Module 5 – Sharps Injury Prevention & Safety Devices

Regulators: OSHA 1910.1030(d)(2), NIOSH guidance, FDA medical device regulation

Key Topics:

- Safety-engineered devices and employer obligations
- Sharps disposal container requirements
- Injury prevention strategies
- Documentation and sharps injury logs

Learning Outcome: Learners understand regulatory expectations for sharps safety.

Module 6 – Specimen Handling, Packaging & Transport

Regulators: DOT 49 CFR, IATA DGR, CLIA 493.1103, CAP GEN.40100

Key Topics:

- Category A/B infectious substances
- Required packaging systems (triple packaging)
- Chain-of-custody

- Internal versus external transport requirements

Learning Outcome: Learners apply regulatory rules for compliant transport of clinical specimens.

Module 7 – Chemical Hygiene, Hazard Communication & Laboratory Chemicals

Regulators: OSHA 1910.1450, OSHA 1910.1200, NFPA 704, EPA RCRA, CLSI GP17

Key Topics:

- Chemical Hygiene Plans and SDS requirements
- Labeling standards and NFPA hazard coding
- Storage compatibility
- Spill kits and hazard communication training

Learning Outcome: Learners describe regulatory requirements for chemical safety in labs.

Module 8 – Waste Management & Spill Response

Regulators: EPA medical waste regulations, OSHA HAZWOPER, DOT 49 CFR, TJC EC standards

Key Topics:

- Classification of biomedical vs chemical waste
- Proper disposal and documentation
- Spill response procedures and regulatory obligations

Learning Outcome: Learners demonstrate understanding of compliant waste management.

Module 9 – Engineering Controls & Laboratory Infrastructure

Regulators: OSHA BBP, CDC BMBL, CLSI M29

Key Topics:

- Biological safety cabinets
- Ventilation requirements
- Safety showers and eyewash stations

- Engineering vs administrative controls

Learning Outcome: Learners identify required engineering controls and their regulatory bases.

Module 10 – Equipment & Instrumentation Safety

Regulators: OSHA Subpart O, CLIA 493.1252, FDA device regulations

Key Topics:

- Machine guarding and equipment operation
- Calibration, QC, and maintenance documentation
- Manufacturer instructions and regulatory compliance

Learning Outcome: Learners understand safe operation and regulatory obligations for instruments.

Module 11 – Ergonomics & Workplace Safety

Regulators: NIOSH, OSHA General Duty Clause

Key Topics:

- Ergonomic hazards and safe lifting
- Repetitive motion injury prevention
- Workstation design

Learning Outcome: Learners apply ergonomic best practices tied to regulatory expectations.

Module 12 – Emergency Preparedness & Response

Regulators: TJC EC.02.03.01, OSHA 1910.38, NFPA 10, CLIA 493.1202

Key Topics:

- Emergency action plans
- Fire extinguisher classifications
- Evacuation drills and documentation

- Continuity of operations

Learning Outcome: Learners demonstrate understanding of mandated emergency procedures.

Module 13 – Radiation & Laser Safety

Regulators: NRC 10 CFR Part 20, OSHA 1910.1096, ANSI Z136

Key Topics:

- ALARA principles
- Dose limits and monitoring
- Laser classifications and control measures

Learning Outcome: Learners describe regulatory requirements for radiation and laser safety.

Module 14 – Quality Systems, Accreditation & Inspection Readiness

Regulators: CLIA 42 CFR 493, CAP GEN, TJC Lab Standards, ISO 15189

Key Topics:

- Documentation requirements
- Competency assessments
- Deficiency types and correction plans
- Integration of safety into QM programs

Learning Outcome: Learners prepare labs for accreditation surveys with a focus on safety compliance.

Module 15 – Information Security, Privacy & Ethical Safety Culture

Regulators: HIPAA, HITECH, TJC IM standards, OSHA injury reporting

Key Topics:

- PHI protection and secure data handling
- Ethical responsibility in lab practice
- Safety culture, incident reporting, leadership accountability

Learning Outcome: Learners connect safety culture with regulatory and ethical mandates.