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Strengthening laboratory safety through continuous learning

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Safety in the laboratory is not a one-time achievement, it is a practice that must be continuously reinforced. Skills fade without repetition, procedures lose relevance without updates, and new hazards emerge as technology, workflows, and staffing evolve. To keep pace with these

changes, laboratory professionals must engage in ongoing, intentional learning. Continuous education in laboratory safety is not simply beneficial; it is the most effective way to ensure teams remain prepared to recognize risks and respond appropriately in an environment where conditions shift daily.

Traditional onboarding alone cannot sustain a culture of safety. New-hire orientation often compresses essential safety content between facility tours, introductions, and extensive paperwork, leaving critical principles diluted or overshadowed. Follow-up annual modules frequently fail to close the gap—many are generic, repetitive, or disengaging, prompting staff to rush through them with minimal retention. For safety to be meaningful and durable, education must be designed as an ongoing, dynamic process rather than a static requirement.

Earning CEUs

See test online at <https://ce.mlo-online.com/courses/Strengthening-laboratory-safety-through-continuous-learning>. Passing scores of 70 percent or higher are eligible for 1 contact hour of P.A.C.E. credit.

LEARNING OBJECTIVES

Upon completion of this article, the reader will be able to:

1. List different avenues to obtain safety credits for continuing education (CE).
2. List and describe the various periodicals that are available that can aid laboratorians as an additional source of laboratory safety knowledge.
3. Discuss how safety guidelines are developed using science of safety reasoning.
4. Describe additional certification opportunities that are available to laboratory scientists.



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Credits for certification

Continuing education is not just a regulatory box to check for today's laboratorian—it is an essential component of maintaining competence and accreditation. Medical Laboratory Scientists (MLS) and Medical Laboratory Technicians (MLT) are required by their accrediting bodies to remain current with evolving science, technology, and safety standards.

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recapping is a
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American Society for Clinical Pathology (ASCP)-certified professionals must renew every 3 years by earning 36 continuing education (CE) credits covering safety, ethics, and discipline specific topics. Similarly, American Medical Technologists (AMT)-certified laboratorians follow a three-year cycle but are required to complete 45 CE hours.

With busy laboratory schedules and staffing constraints, flexible CE options are essential. Fortunately, laboratorians can obtain CE credits through numerous accessible formats. Attending institutional or healthcare seminars, participating in employer-provided annual training, or completing journal-based learning associated with accredited programs are a great way of attaining credit. These options offer streamlined ways to merge certification maintenance with daily operations. Webinars, however, remain the gold standard for many, offering the on-demand versatility needed to fit into an unpredictable shift.

One of the most widely recognized mechanisms for awarding continuing education credit is the Professional Acknowledgment for Continuing Education (P.A.C.E.) program, administered by the American Society for Clinical Laboratory Science (ASCLS).¹ P.A.C.E. serves as the quality assurance framework ensuring that participating programs meet the standards necessary for clinical laboratorians to maintain licensure and certification. P.A.C.E. credits are accepted by ASCP, AMT, and numerous state agencies, making them a reliable path for professionals across the country.

Organizations such as LabCE/Medialab and ASCP offer a variety of courses that conclude with P.A.C.E. credits. Even though there is a price attached, they are still great resources. Both have an extensive online library, ranging from OSHA safety modules to lab-specific safety courses and have methods for participant CEU tracking.

For those looking for a more cost-friendly option, excellent free resources exist as well. The CDC's OneLab REACH² program offers a comprehensive library of free CE courses covering safety topics such as chemical fume hood operation, centrifuge safety, bloodborne pathogens, and laboratory risk management. ARUP's Scientific Resource for Research and Education is another free resource.³ These offerings support laboratory professional education by providing a wide range of online webinars and educational courses, all lead by professionals in their field.

Some webinars and training programs provide P.A.C.E. credits, while others issue general certificates of completion that satisfy most employer-based requirements. These can be highly valuable for laboratory staff and leadership, particularly when continuing education must align with accreditation expectations and support ongoing competency.

Periodicals — Reading like a lab safety professional

Developing a strong safety mindset requires more than annual training—it grows when individuals continually engage with reliable, safety-focused information. One of the most effective (and often free) ways to do this is by subscribing to safety periodicals. These publications help staff stay connected to current issues, emerging risks, and best practices. Some periodicals concentrate on laboratory safety, while others provide a broader view of occupational and environmental health. Even if a publication does not offer continuing education credits, the insights gained can elevate safety awareness and decision-making.

Several well-established periodicals provide valuable perspectives on laboratory and workplace safety (*Medical Laboratory Observer* is one of them). *CAP Today* serves as a source for operational and regulatory updates. Its focus on accreditation changes, personnel requirements, and compliance expectations helps laboratories stay aligned with evolving CLIA and CAP standards. For those seeking a deeper understanding of chemical safety, the American Chemical Society (ACS) offers a wealth of technical guidance, research-based commentary, and educational articles on chemical hazards and mitigation strategies. ACS resources (available via their website) are particularly useful for reinforcing safe practices in labs where chemical handling plays a central role. Expanding beyond the laboratory environment, publications such as *Occupational Safety & Health (OS&H)* and *Environmental Health & Safety (EH&S)* widen the perspective to include broader aspects of workplace safety. These periodicals frequently highlight OSHA updates, emerging safety technologies, product reviews, training approaches, and analyses of real-world incidents. Their post-incident reviews are especially valuable, encouraging readers to examine root causes and consider how similar risks can be identified and reduced within their own organizations.

The value of these resources extends beyond personal development. Laboratory leaders can easily integrate selected articles into staff education. Assigning short readings for a shift huddle or monthly meeting encourages group discussion and shared learning. Articles that describe significant safety events can be especially impactful, prompting conversations about current preparedness, gaps in practice, and opportunities to reduce risk. By routinely engaging with these periodicals, staff strengthen their safety literacy, stay aware of evolving expectations, and reinforce a culture that prioritizes proactive risk management.

The science of safety

The ongoing learning gained through CE programs and safety-focused publications reinforces knowledge of best practices, but meaningful, lasting safety culture requires more than exposure to information. It requires understanding. To fully internalize and apply safety principles, laboratorians benefit from examining the scientific reasoning that underpins every safety guideline. Beneath every safety rule is a scientific principle that explains why those rules exist in the first place. These principles are rooted in the science of chemistry, microbiology, physics, ergonomics, human behavior, and more. When laboratorians understand the science behind safety, compliance becomes less about obligation and more about informed decision-making.

Consider chemical exposure limits, for example. Occupational exposure limits are not arbitrary numbers selected for convenience; they are derived from toxicological data, dose-response relationships, and epidemiological studies. The same is true for biological safety levels, engineering controls (such as biosafety cabinets), and ventilation requirements. These controls exist because they interrupt known exposure pathways, whether aerosolization, skin absorption, ingestion, or inhalation. Understanding how hazards behave in real-world laboratory conditions allows staff to better recognize risk, even in situations not explicitly covered by a written procedure.

The science of safety also applies to biological hazards. The way microorganisms survive on surfaces, resist disinfectants, or spread through droplets and aerosols directly informs cleaning protocols, PPE selection, and workflow design. Without this knowledge, safety practices can quickly devolve into rote

behaviors that are followed inconsistently or abandoned under time pressure. When laboratorians understand how a pathogen spreads or why a disinfectant requires a specific contact time, they are far more likely to perform the task correctly every time.

Human factors science is another critical component of laboratory safety. Errors are rarely the result of carelessness alone; they are often linked to fatigue, distraction, poorly designed workspaces, or unclear communication. Safety science teaches us that systems must be designed to support human performance, not rely solely on individual vigilance. This perspective shifts the focus from blaming individuals to improving processes, layouts, and workflows that reduce the likelihood of error.

For laboratorians seeking a deeper dive into the origins of safety regulations, formal coursework can be an effective option. Programs such as laboratory safety courses offered through OSHA-authorized education providers explore the regulatory framework developed by the Occupational Safety and Health Administration, explaining how standards evolved in response to real-world incidents, injuries, and exposures. These courses connect regulatory language to practical laboratory applications, helping professionals understand not only what is required, but why it matters.

The science of safety also relies on measurable data that can be translated into action. In the laboratory, safety is not abstract; it can be quantified through tools such as risk assessments, safety audit scores, incident reports, and injury or exposure trends. These metrics provide objective evidence of where hazards exist, how well controls are functioning, and where gaps persist. A risk assessment that identifies repeated exposure potential, an audit score that reveals inconsistent PPE use, or an uptick in sharps injuries are not simply numbers on a spreadsheet; they are indicators that corrective action is needed. When properly analyzed, safety data drives the selection and prioritization of controls (whether engineering, administrative, or behavioral) and helps ensure those controls remain effective over time. Using data in this way reinforces safety as a science-based discipline, grounded in continuous evaluation and improvement rather



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than assumptions or anecdotal observations.

Ultimately, the science of safety transforms laboratory safety from a checklist into a mindset. It empowers laboratorians to anticipate hazards, question unsafe practices, and adapt safely when conditions change. In

a profession where variables constantly shift—new instruments, emerging pathogens, staffing challenges—this deeper understanding is essential for protecting both laboratory professionals and the patients they serve.

Safety certification

Continuing education is often viewed as a requirement tied to maintaining professional credentials, but safety-focused certification can play a much larger role than meeting renewal criteria. Safety certifications validate a laboratorian's commitment to understanding risk, regulatory compliance, and best practices that protect people, processes, and facilities. They also signal to employers that safety is not an afterthought, but a professional priority. Targeted safety certifications allow laboratorians to build deeper expertise beyond minimum requirements.

One such option is the Qualification in Laboratory Safety (QLS) offered via ASCP.⁴ Safety credentials like this focus specifically on laboratory risk management, regulatory interpretation, incident prevention, and safety program evaluation. They are particularly valuable for individuals who serve as safety officers, supervisors, or educators, but they also benefit bench-level staff who want to strengthen their understanding of laboratory hazards.

OSHAcademy's *Laboratory Safety* certification program offers a comprehensive, self-paced overview of OSHA laboratory standards, PPE, chemical hygiene, and hazard communication.⁵ The course content is easy to access, provides 0.4 International Accreditors of Continuing Education and Training (IACET) CEUs, and offers an optional certificate for purchase. For a shorter introductory option, the OSHA Education Center's *Orientation to Laboratory Safety* course delivers a one-hour overview of essential safety principles at a low cost and includes a completion certificate.⁶ These resources offer accessible pathways for staff to deepen their regulatory knowledge, strengthen compliance skills, and better appreciate the scientific

and regulatory foundations that guide safe laboratory practice.

Beyond technical knowledge, safety certifications reinforce leadership skills. Certified safety professionals are often better equipped to conduct risk assessments, investigate incidents, and communicate effectively with both staff and administration. They understand how to translate regulatory language into practical action and how to advocate for safety improvements using data rather than anecdotes. In this way, certification supports not only individual growth, but organizational resilience.

Conclusion

Laboratory safety is not mastered in a single orientation session, annual refresher, or certification cycle. It is a continuous learning journey that evolves alongside science, technology, and workplace realities. Each article read, webinar attended, and course completed adds another layer of understanding, strengthening not only individual performance, but the collective safety culture of the laboratory.

By investing in ongoing safety education, laboratorians move beyond compliance toward competence and confidence. They become better equipped to recognize hazards, question unsafe norms, and contribute to safer systems for their colleagues and patients alike. In a profession built on precision and trust, continuous safety learning is not optional, it is essential. 📌



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References are available online at mlo-online.com/55361396.