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Move beyond policies to build a lab culture where safety is second nature

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October 2025

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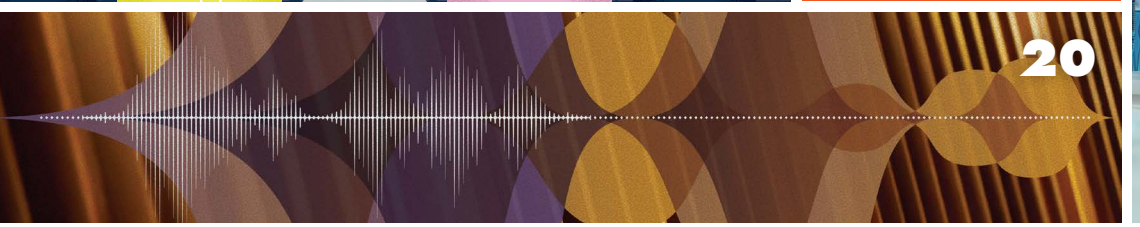

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culture, care, and safety

Laboratory safety is never static. It requires constant attention, adaptation, and leadership at every level. For this October issue, we've dedicated our pages to exploring how labs can build stronger, safer cultures while managing the evolving risks that come with modern science.

Our cover story by Jason P. Nagy, PhD, MLS (ASCP), takes a closer look at how true safety culture develops through trust and daily practice. He emphasizes that staff buy-in and consistent leadership follow-through are what transform safety from a checklist into a shared value. In another feature, Robert Emery brings his decades of expertise to the distinction between safety and security—two concepts often conflated, but each essential to protecting people, research, and facilities. You'll also find Dan Scungio's detailed guidance on conducting chemical risk assessments, along with insights from Don Martin on identifying serious injury and fatality precursors before they escalate into life-altering events.

Of course, safety isn't just the theme of this issue—it's a core part of *Lab Manager*'s ongoing mission. We regularly publish safety-focused content online, deliver our Lab Health & Safety newsletter straight to your inbox twice each month, and host webinars and digital events that expand on these topics. Looking ahead, our 2026 Lab Manager Leadership Summit will feature two interactive safety workshops: one on practical risk assessment tools and another on how leaders can strengthen safety through communication and decision-making.

We invite you to explore the articles in this issue and continue engaging with our safety resources throughout the year. If you'd like to learn more about any of these offerings or need assistance in registering for the newsletter or events, I am happy to help.

Enjoy,

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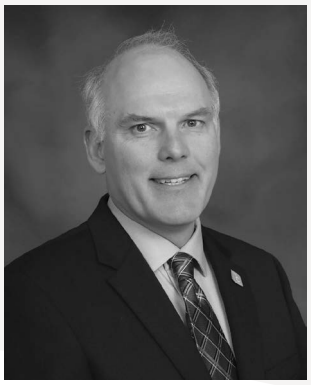


MANAGER MINUTE

Three Keys to Improve Resilience in the Lab

by Scott D. Hanton, PhD

Resilience is an important trait for successful lab scientists. The American Psychological Association defines resilience as "…the process and outcome of successfully adapting to difficult or challenging life experiences…" Lab work can be both difficult and challenging, but lab managers can help staff grow their resilience and ability to bounce back from adversity by building a supportive community in the lab. Here are three tips to help your lab develop greater resilience:

#1 – Prioritize relationships

In his keynote address at the 2025 Lab Manager Leadership Summit, Kim Cameron, professor at the Ross School of Business at the University of Michigan, emphasized the importance of social connections and relationships. Trusted relationships in the lab lead to increased wellness, higher employee engagement, and better mental health. Lab managers can seek opportunities for everyone in the lab to have a sense of belonging, train supervisors to generate trusting and respectful relationships with their direct reports, and eliminate disrespectful and uncivil behavior from the lab. Prioritizing relationships will enable every individual to reach their potential and for the lab to successfully deliver for its stakeholders.

#2 – Communicate purpose

When staff understand and believe in the purpose of the lab, they are more likely to bounce back from technical challenges, and drive for creative solutions. Lab managers must clearly communicate the purpose and mission of the lab. The purpose centers around why the lab exists, who benefits from the technical output, and how the work helps drive a better world to live in. Having a clear purpose helps staff understand why it is important to adapt to changing circumstances and to navigate technical difficulties and challenges.

#3 – Ask for help

Lab work can be difficult and challenging. A key tactic that helps staff adapt and bounce back from those challenges is the freedom to ask for help. Many scientists wrongly believe that they need to know what to do next and have the best ideas. However, lab managers can build a more resilient team by modeling vulnerability to ask for help, ask for ideas, and ask for feedback. Asking for help allows everyone to contribute to the lab's progress and share the responsibility for ideas to attack the technical problems differently.

Building a lab community where teammates can rely on each other for support, empathy, and ideas will enable them to ask for help to solve the challenges the lab is built to answer. Through this support, each member of the lab team will develop greater resilience and adaptability.

Thanks for reading. I hope you can use this information. I am very interested in hearing from you. If you have feedback or comments on this set of tips, or suggestions for future Manager Minutes, I'd love to hear from you. Please reach out to me at ***shanton@labmanager.com****. I'm looking forward to our conversations. Thanks.*

TURNING SAFETY PRINCIPLES INTO DAILY PRACTICE

Move beyond policies to build a lab culture where safety is second nature

by Jason Nagy, PhD, MLS (ASCP)

"One of the most impactful acts a manager or safety representative can do is show urgency when it comes to staff safety."

A robust safety culture doesn't happen by accident; it requires deliberate action from every level of laboratory staff. Laboratory managers, safety representatives, and even directors have a responsibility to maintain a safe environment for the staff.

Plenty of advice exists to help improve lab safety culture, but simply knowing what to do isn't enough.

Safety audit results, key performance indicators, and injury and exposure rates can give leadership a glimpse of where the lab ranks regarding safety. However, improvements to the safety culture are not possible if they aren't prioritized. Real progress comes when leaders step up to actively drive the changes needed to improve the safety culture.

Culture is contagious—empower the right people to lead by example

Your laboratory's greatest asset is its people. Aside from lab leaders, informal influencers can have a significant impact on your lab safety culture. A positive influencer can boost morale and get others onboard with safety. Their energy and safety-minded attitude can

spread and feed into the culture. These individuals need encouragement and support from leadership, otherwise their positive energy may fizzle out. Acknowledging safe acts in the eyes of lab employees not only gives those positive influencers the recognition they deserve, but it can also motivate others to adopt those safe behaviors. Of course, not all influencers can be positive.

There are those in the lab that drain the safety culture but require attention as well. When staff do not feel there are consequences for skirting around safety policies or procedures, there is no motivation or incentive to change inappropriate behavior. Managers must enforce the rules and regulations to keep staff and visitors safe. However, accountability should not stop there. Managers should also be held accountable for letting unsafe acts go unnoticed. Something as simple as not enforcing the use of personal protective equipment (PPE) could land the lab, hospital, or organization in hot water with regulatory agencies like the Occupational Safety and Health Administration (OSHA). For example, as part of OSHA's Bloodborne Pathogen standard, employers not only have to ensure that PPE is available but actively enforce its use when deemed necessary (OSHA 1910.1030(d)(3)(i)). Upper management should take notice when labs fail to follow safety standards and encourage leaders to prioritize adherence to rules and regulations.

Use feedback tools to assess and improve safety culture

What you think you know about your lab's safety culture might only be on the periphery of what's really going on. Safety surveys, Gemba walks, and temperature checks are not to be overlooked. These tools are essential to understanding where your safety culture stands, where it needs to be, and how the lab needs to improve. One of the most impactful acts a manager or safety representative can do is show urgency when it comes to staff safety. Whether a staff member brings a new safety concern to the manager, or a safety issue is found during an audit, how the manager responds sends a message to the staff. Managers that respond swiftly to the problem show staff the safety of the laboratory environment and the well-being of the employees are important. Staff are more likely to bring up concerns knowing that they will be resolved in a reasonable amount of time. On the other hand, staff are less likely to report unsafe conditions if managers do not make it a priority to address their concerns. Failing to correct issues found during an audit not only makes the audit a waste of time, but it can quickly damage the safety culture and may give the employees the impression that leadership is not concerned with their safety. Once staff feel safety is not an integral element in their lab, employees may choose to disregard safety policies themselves or decide to leave the lab altogether.

Empower staff to speak up and share solutions

What is the best way to get staff to recognize hazards in the lab and to make the necessary changes to mitigate those risks? Managers who openly discuss these hazards and include staff in the discussion have the most success. It takes time and effort to improve a lacking safety culture, so you will have to come in on those off shifts, be present on weekends and holidays, and talk to each employee multiple times throughout this process.

Start by introducing discussions around safety during shift changes or huddles. If your labs run three shifts, try to be present at the third to first shift change, and at the first shift to second shift change. Within two five–10-minute meetings, you are able to meet with every employee working in a single day. Aside from discussion around lab operations, bring up any safety concerns. If the lab is experiencing an increase in injury and exposure rates, talk about the issues. Ask staff why they think there is an increase. Ask them how or why they think

the incidents occurred and discuss how they could have been prevented. This not only gives you their perspective but shows that you value their input.

When it is time to discuss how to develop better safety in the lab, start by asking the staff what changes they feel are necessary to make improvements. With this approach, changes in the lab are not coming from the top down, but from within the lab itself. If an employee recently sustained exposure to the eyes because they dropped a sample and were not wearing eye protection, have the staff discuss openly the best way to prevent a splash to the eyes. That is more impactful than a manager telling staff that goggles must be worn in the lab. More staff involvement leads to better staff buy-in, which is crucial for culture change.

Safety culture is everyone's responsibility

Laboratory staff do more than simply run tests and generate results. They control the dynamic of the environment, the atmosphere, and, yes, the safety culture. Just as the lab cannot function without great leadership, the culture and climate need attention, too. By prioritizing open communication, regular training, and continuous evaluation of safety practices, organizations can significantly reduce incidents and create a safer environment for both employees and patients. Safety isn't a box to check—it's a continuous journey that benefits every member of the laboratory community.

***Jason P. Nagy**, PhD, MLS (ASCP) received his bachelor and master of science in clinical laboratory scientist from Virginia Commonwealth University in Richmond, Virginia. He then attained his PhD in health related sciences with track in clinical laboratory science from VCU in 2018. He has held various positions across the lab environment and is now the lab safety support coordinator for Sentara Health, a hospital system with laboratories throughout Virginia and North Carolina. In addition to his role in the hospital, he has been a key safety speaker, author, and educator for labs across the country.*

How to Build a Purpose-Driven Laboratory Team

LEARN COMMUNICATION STRATEGIES TO FOSTER CAMARADERIE AND BOOST EMPLOYEE ENGAGEMENT **by Holden Galusha**

When lab staff understand how their work connects to meaningful outcomes, from technological breakthroughs to life-changing therapies, they become more engaged, resilient, and innovative. But fostering this sense of purpose isn't automatic. Effective lab purpose communication is comprised of intentional communication, clear values, and the ability to help your team see the bigger picture. Kelly Sullivan, global director of operations and labs at CIC, shares her insight into transforming your lab from a collection of individual contributors into a unified team driven by shared purpose and scientific integrity.

> "At the end of the day, it's *humans* helping you achieve compliance and push things forward. You have to remember that."

The core values of the lab

If the lab's purpose is its destination, then its values are the compass to it. Identifying core values will help you run your lab in alignment with its purpose. Core values play a key role in lab purpose communication, helping staff connect daily work to shared values. If staff feel that the lab's values resonate with them and that their work is in step with those values, they will likely feel more motivated to press through challenging times and keep the lab's purpose in sight.

Sullivan names three core values that shape her leadership approach and her lab's operations. These values, she says, are largely universal for labs across industries:

1. Transparency

"Transparency is really important to me," Sullivan says. "A lot of times, because things can be so sensitive in terms of the science and intellectual property, you want to be as transparent as possible. . .and having that transparency is really important to making sure that everybody feels on board and connected to the work that they're doing." Indeed, when employees feel like they are trapped in their own silos, both motivation and innovation can suffer. Employees won't have as clear of an understanding of how important their work is in pursuing the lab's purpose, and without fresh eyes looking at challenges, the lab's internal innovation may stall.

2. Integrity

"Integrity is huge. Scientific integrity and ethics are at the core of all science work that we do," Sullivan notes. Part of running a successful lab, she says, is holding employees to this core value in particular, because it represents the distillation of what they do: try to discover truth through the scientific method. Without integrity, the whole enterprise is undermined. Strong lab purpose communication reinforces why scientific integrity is essential to the lab's mission.

3. Remembering the human element

Informed by her time in the service industry before working in the lab, Sullivan says that the final core value is

human centricity. "This core value, for me, is not getting so far away and tripped up in compliance and 21 CFR and all these day-to-day concerns. It's about making sure that you *don't* get far away from the human element. At the end of the day, it's *humans* helping you achieve compliance and push things forward. You have to remember that."

Human centricity isn't just a core value; it's the lens through which you can define your lab's greater purpose. And for Sullivan, recognizing this core value was a catalyst in how she changed her view of her work.

Seeing your work in the bigger picture

According to Sullivan, the key to seeing your lab's purpose—a purpose beyond profitability—is to view it in the bigger picture. She tells of the first time she experienced this firsthand:

"Early in my career, I was in academia. A lot of times, in academia, it's so separate from what you're working. . .you don't really see what the end goal is, and how your work helps progress towards it."

But things changed after her postdoc. Sullivan began working for a researcher who was focused on autoimmune disorders, seeking to help psoriasis patients in particular:

"When I started working with [the researcher], I met these patients and began to see how the work we were doing, the formulations we developed, were changing things for them. [And] these people had been *trying* everything. That's when it really resonated." After that experience, even when Sullivan sat at the biosafety cabinet—headphones on, podcast playing—she still felt the impact of meeting those patients, and that motivated her work in the lab, even though there was a degree of separation between her and the patients. She was aligned with the lab's purpose. That connection was the result of effective lab purpose communication and firsthand experience.

An important takeaway from Sullivan's story is that resonating with the lab's purpose is, ultimately, something that can only be experienced firsthand. As a lab leader, you can't force the resonance top-down. But there are ways to encourage that mindset: namely, storytelling and aligning strengths with the mission.

Communicating the lab's purpose to staff

An intuitive way to communicate your lab's purpose is to frame it within a narrative. "A lot of communication about purpose is learning to be a storyteller," Sullivan says. She used this technique to illustrate the impact of her team's work running the labs at CIC decontaminating a drug development lab's incubators.

"Saying to [my] team, 'Hey, do you understand that the company we supported developed this [new drug]?' takes the perspective from 'The client's incubators are decontaminated,' to 'Our decontamination played a small, but vital, role in bringing this drug to market.' You become a part of something larger." That client ended up creating a new hemophilia drug that was approved by the FDA, achieving something with only a 10 percent chance of success.

> "A lot of communication about purpose is learning to be a storyteller."

Having difficult conversations

Sullivan agrees that scientific work tends to self-select for intrinsically motivated, purpose-minded personalities. Lab managers have an advantage in this sense. "[But] there are a lot of people to whom science is just a job. They show up and do it," Sullivan admits.

This attitude isn't necessarily wrong. It can be healthy to draw such lines if you're trying to maximize work-life balance, especially during life's more stressful times. But issues may arise if this attitude impacts performance. As a manager, Sullivan says, you may need to have difficult conversations with staff who are clearly unengaged with the lab's purpose because it could be a sign that this is not the right role for them. The meaning they're seeking may be in another role that better aligns with their own interests and core values.

Key takeaways

Leading a purpose-driven lab ultimately comes down to three essential elements: establishing core values that guide decision-making, contextualizing your lab within a larger mission, and communicating that mission through compelling storytelling. When transparency, integrity, and human-centricity become your lab's foundation, and when every team member understands their role in bringing life-changing innovations to market, you create an environment where both scientific excellence and employee engagement thrive.

Holden Galusha *is an associate editor for* Lab Manager. *He can be reached at hgalusha@labmanager.com.*

Successfully Transitioning from the Bench to Management

DOS AND DON'TS OF LEARNING EFFECTIVE LAB MANAGEMENT

by Scott D. Hanton, PhD

Stepping into a lab manager role often means leaving behind much of the work that you know, are comfortable, and drove your success for an entirely different set of challenges.

Here are a couple of things our *Lab Manager* audience has told us about the transition:

- Most lab managers are promoted from within and come from the staff of bench scientists
- Up to 70 percent of what lab managers are concerned with has little to do with the specific branch of science that the lab delivers

Based on my own experiences over a 30-year lab career as a research scientist and lab manager, and many great conversations with other lab managers, a picture develops of what experienced lab managers look for when selecting new leaders, and which priorities set those new lab managers up for success.

Something new

In the book *What Got You Here Won't Get You There*, Marshall Goldsmith makes the argument that the skills and behaviors that generated success at the lab bench won't enable you to be successful as a lab manager. Therefore, you'll need to develop new skills and priorities to be successful. Some keys to learning these skills are:

- **Humility:** You might not know what you don't know yet. Be humble and start learning how this role works and what you'll need to develop.
- **Vulnerability:** Ask questions. Get help. Admit your ignorance and your mistakes. I've often told the story that as the general manager of Intertek Allentown, people would ask me why I got the role. My response was that I'd made more mistakes than anyone else, so I had more opportunities to learn.
- **Growth mindset:** Focus on learning. Treat the challenges of this role as opportunities to grow and develop.

> "The focus moved from what *I* could deliver to what *we* could deliver."

Leading people

As a senior scientist, my role was to deliver innovative problem-solving for our stakeholders. As a lab manager, my role was to help people successfully navigate the challenges our stakeholders presented and deliver useful outcomes. The focus moved from what I could deliver to what we could deliver. This change of focus required these priorities:

- **Care:** The transformational leader Melanie Klinghoffer says, "If you care, they'll care." Demonstrating that you care about the people in the lab, their lives, their success, their development, their challenges, and their delivery becomes the route to success. Everything the lab achieves is through the people.
- **Listen:** Practice active listening to learn from your people. Better information yields better decisions.
- **Support:** Provide the scientists what they need to be successful. This is a combination of relationship building, communication, resources, and belief.
- **Protection:** Protect the staff from unreasonable

expectations, toxic personalities, unresolved conflict, and lack of support.

Lead the culture

Every lab has a culture, a way that the work gets done. Some cultures are exemplary, and some are negative and destructive. Understand the nature of your lab's culture and take steps to make it more positive. Build a safe place to work where belonging, social connections, emotional and psychological safety abound, and effective teams can cooperate for success. Build the work environment that enables most of the people to thrive and flourish.

Make decisions

The whole lab depends on the decisions made by the lab manager. To be successful, lab managers need to make consistent, well-intentioned, and data-driven decisions. Build an effective problem-solving decision-making process that uses all the expertise, experience, and data in the lab. Making prompt decisions enables people to move forward with their work and seek the outcomes demanded by your stakeholders.

No one is perfect and not all your decisions will work out as planned. Understand that most decisions can be changed or nullified. A key learning from one of my previous supervisors, Sherri Bassner, vice president at Intertek, was, "Document your assumptions." By understanding our assumptions, we can make better decisions as new information becomes available.

Manage the systems

The lab manager is accountable for all aspects of the lab, including safety, quality, and operations. These are elements of the lab where success derives from doing things right. Learn about the details of these systems, so that you can drive improvements and engagement with staff. Incorporating safety, quality, and delivery into the culture of the lab will deepen the participation of staff and improve the performance of the lab.

In my own transition from scientist to lab manager, I went from resisting the quality system as an unwelcomed interference on by ability to innovate to implementing an ISO 17025-accredited quality program in the lab. My vision and understanding of the importance of lab quality changed with the perspective of a different role.

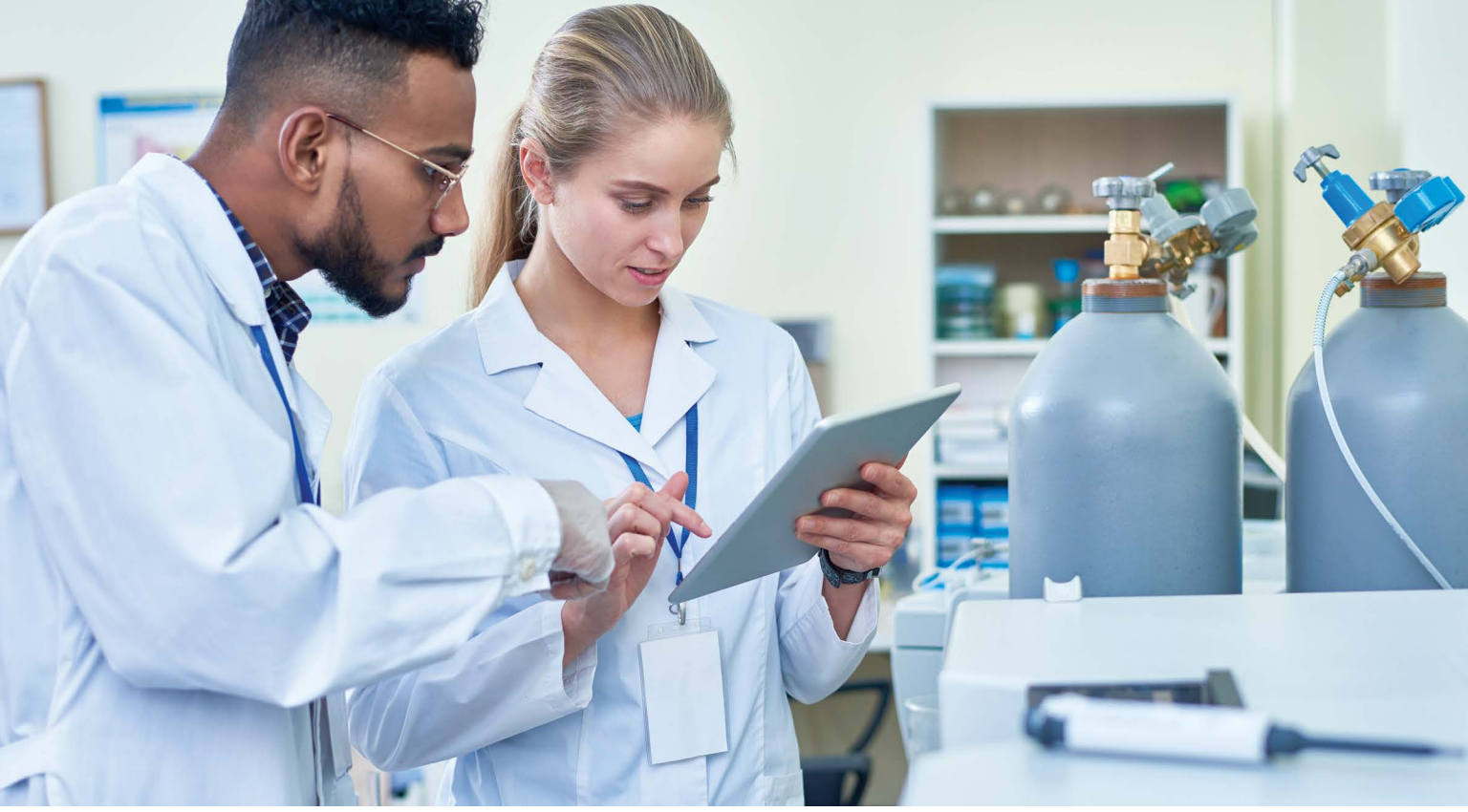
Dos and don'ts

Here are some distilled lessons from my experience and my conversations with other lab managers:

DO	DON'T
Actively listen to everyone on staff.	Act like you already know everything.
Incorporate everyone's ideas.	Promote only your ideas.
Care about and support everyone.	Seek personal gain.
Consistently do the right things.	Consistently do easy things.
Ensure that important activities are done right.	Ignore difficult situations and outcomes.
Make prompt data-driven decisions.	Procrastinate on decisions while waiting for more information.
Share your knowledge and help others.	Protect your knowledge to keep power.
Help everyone succeed.	Help your loyal favorites succeed.
Admit your ignorance and ask for help.	Hide behind a false bravado and forge ahead.
Build a cohesive community and culture.	Drive a homogenous follower culture.
Emphasize curiosity, questions, and shared learning.	Expect everyone to agree with you.
Provide autonomy and ownership.	Make every decision independently.
Give people what they need to be engaged, motivated, and successful.	Demand adherence to your goals.
Actively resolve conflict.	Ignore conflict that you don't start.

The transition from bench scientist to lab manager can be both challenging and thrilling. The opportunity to learn new things, gain a better understanding of how the whole lab works, and have input on the key decisions are worth the effort. Remember that most people leave their boss, not their organization. Be the manager that attracts people, rather than repels them.

***Scott D. Hanton**, editorial director for* Lab Manager, *can be reached at shanton@labmanager.com.*



MEDICAL GAS SOURCING STRATEGY

Sourcing medical gas is more than a purchase order—learn seven key considerations that should inform your strategy

With every medical gas delivery request, you make a decision that impacts safety, efficiency, compliance, and operating costs. As a lab manager or operations leader, you must examine more than price. Here are seven key considerations to guide your sourcing strategy and inform your decisions.

1. DEFINE YOUR GOALS AND NEEDS

Begin by assessing your lab's specific applications. Do you use ultra-high-purity oxygen for cryopreservation or nitrogen for sterilization, chromatography, or sample storage? Identify volume, purity, delivery frequency, and emergency-backup requirements. Compare these needs against what your current supplier delivers.

2. REGULATORY COMPLIANCE MATTERS

Ensure your supplier can certify batch testing, provide traceable documentation, and deliver cylinder-tracking records aligned with the regulatory guidelines your lab operates under, whether Food and Drug Administration Medical Gas rules, USP and National Formulary (NF) specifications, or ISO 9001 or ISO/IEC 17025 quality-management system standards.

3. SUPPLY-CHAIN RELIABILITY

Supply consistency is critical, especially for sensitive applications like MRI equipment, cryotherapy, platelet cooling, or controlled-atmosphere storage. You need assurance that deliveries arrive intact, on schedule, and with complete visibility into cylinder status. Reliable suppliers also provide contingency plans for shortages, ensuring your lab can keep running even during supply disruptions.

4. FLEXIBLE PURCHASING MODELS

Do you rent cylinders, lease microbulk tanks, or buy in bulk? Do you receive ad-hoc deliveries or scheduled drops? Compare total costs and flexibility. A strategic

supplier should help you match supply models to your actual usage patterns, reducing waste while supporting scalability as your needs grow.

5. COST STRATEGY WITH TRANSPARENCY

Don't forget about the total ownership costs including cylinder rent, delivery fees, testing charges, maintenance, refill surcharges, emergency dispatches, and audit compliance support. Transparent billing and clear reporting help you avoid hidden expenses and confidently forecast your lab's operational budget.

6. DATA-DRIVEN DECISION-MAKING

To make good decisions, you need data: delivery-time consistency, cylinder-downtime rates, product-quality failures, usage volumes, spend per unit, and contract-renewal uptime. A supplier who shares actionable data empowers you to make informed sourcing decisions and demonstrate measurable value to stakeholders.

7. EVALUATING ALTERNATIVES AND PARTNERSHIPS

Compare your current vendor with multiple top suppliers for medical gases, including regional and national providers. Use criteria such as quality and purity, compliance credentials, delivery flexibility, asset management, price transparency, reporting, and technical support.

DATA THAT DRIVES SMARTER SOURCING

Is your supplier helping you succeed? The answer is in the data. Track and evaluate these metrics to turn sourcing into strategy:

- **Application fit:** Measure gas purity, volume demand, and custom mix requirements
- **Compliance and certification:** Review documented FDA, USP, NF, and ISO credentials
- **Supply chain and logistics:** Monitor delivery lead times, cylinder turnover rates, and inventory accuracy
- **Purchasing flexibility:** Compare the costs of cylinders versus bulk or microbulk supply
- **Transparent costing:** Examine hidden fees, rental balances, and emergency service charges
- **Data and reporting:** Evaluate how well your supplier provides usage analytics and spend breakdowns
- **Supplier relationship:** Assess responsiveness, technical support, and alignment with your lab's mission

Analyzing these areas gives you a clear picture of whether your current vendor is truly a strategic partner or simply filling orders.

TURNING PROCUREMENT INTO PARTNERSHIP

After identifying what your lab requires, the next question is who can deliver on those needs reliably. Meritus Gas Partners offers a compelling answer. Its nationwide network of independently operated distributors combines the responsiveness of local service with the strength of a large organization, positioning Meritus as an effective partner. Key advantages include:

- **Certified quality:** USP-grade gases with rigorous batch testing and full documentation
- **Reliable supply chain:** Real-time cylinder tracking, optimized logistics, and reduced downtime
- **Flexible delivery models:** Cylinders, bulk, and microbulk options designed to fit your lab's workflows
- **Transparent pricing:** Clear reporting and predictable costs without hidden fees
- **Data-driven support:** Usage analytics and spend breakdowns that help labs optimize procurement

When you evaluate top suppliers for medical gases, look for more than product availability. Look for a partner that elevates your lab's performance.

Meritus Gas Partners delivers certified quality, flexible supply, transparent pricing, and nationwide expertise with local service. It provides the data, compliance assurance, and reliable logistics that help your lab stay efficient and audit-ready. With Meritus, you gain both a supplier and strategic ally committed to advancing your mission.

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Improve Productivity by Building Better Systems, Not Bottlenecks

STREAMLINED WORKFLOWS, SMART USE OF TECHNOLOGY, AND CONTINUOUS FEEDBACK HELP LABORATORY LEADERS ELIMINATE BOTTLENECKS AND BOOST EFFICIENCY

by Michelle Gaulin

Laboratory productivity is often framed as a people problem. If only staff worked faster, stayed more focused, or managed their time better, output would rise. But organizational research—including workflow studies in healthcare and other complex environments—shows the opposite: productivity depends far more on systems than on individuals. When workflows are poorly designed, even the most skilled scientists will struggle to deliver results.

For lab managers, the challenge is not pushing employees harder but creating processes that remove friction, reduce wasted effort, and enable teams to do their best work. As Harvard Business Review notes, "productivity is about your systems, not your people."

Map laboratory workflows to eliminate bottlenecks

Every lab relies on repeatable processes: sample intake, experiment setup, equipment calibration, data recording, and reporting. Bottlenecks often emerge when steps are poorly defined or rely on manual coordination.

Workflow mapping helps managers identify pain points and visualize handoffs. For example:

- **Sample intake**: Delays can arise when technicians must wait for multiple approvals. Streamlining to a single accountable sign-off can cut turnaround times significantly.
- **Equipment scheduling:** Without a centralized booking system, instruments may sit idle while staff argue over access. A shared scheduling platform ensures transparency and maximizes uptime.
- **Data handoffs:** Manual transcription of results introduces errors and wastes time. Automating data capture directly into a lab information management system (LIMS) both accelerates reporting and improves accuracy.

By documenting and analyzing workflows, managers can turn hidden inefficiencies into clear opportunities for improvement.

Standard operating procedures drive laboratory efficiency

Inconsistent processes lead to confusion, duplication, and errors. Standard operating procedures (SOPs) establish a reliable baseline, ensuring that tasks are carried out the same way every time. This consistency is especially important for compliance, reproducibility, and quality assurance.

However, standardization should not be mistaken for rigidity. Effective SOPs include built-in flexibility, such as escalation paths or alternative methods, so staff can adapt when unexpected issues arise. The goal is to create a foundation that eliminates unnecessary variation while still allowing for professional judgment.

Use technology tools to streamline laboratory operations

Digital tools can transform how labs manage resources and share information. Consider:

- LIMS and electronic lab notebooks (ELNs) that automate data capture, reduce transcription errors, and create searchable archives
- Inventory management systems that track reagents, chemicals, and consumables in real time, reducing stockouts and over-ordering
- Automation and robotics that free staff from repetitive tasks such as pipetting or plate handling, enabling them to focus on higher-value activities

These tools not only improve speed but also build resilience into workflows by reducing reliance on manual coordination. Modern digital lab platforms, such as integrated asset-management and ELN systems, enable labs to move from reactive troubleshooting to proactive oversight, boosting uptime, enabling maintenance before breakdowns, and preventing operational disruptions.

Clarify ownership and reduce handoffs in lab processes

Handoffs are one of the most common sources of delay and error in laboratory workflows. Every time a task moves from one person to another, there is potential for miscommunication, rework, or lost time.

Lab managers can address this by:

- Assigning clear ownership of each process step
- Reducing the number of required sign-offs
- Creating cross-functional teams that manage a process end-to-end

Clarity around ownership not only accelerates workflows but also strengthens accountability and engagement among staff.

> "When workflows are poorly designed, even the most skilled scientists will struggle to deliver results."

Strengthen communication to support laboratory productivity

Even the most carefully mapped workflows depend on clear communication. Without it, approvals stall, handoffs get lost, and accountability weakens.

Lab managers can strengthen communication by:

- **Setting clear expectations:** Define who is responsible for each task, and communicate deadlines upfront
- **Creating consistent channels:** Use a single platform or protocol for logging updates, reporting issues, and sharing decisions; multiple, ad hoc channels create confusion
- **Encouraging transparency:** Regular check-ins, whether through daily huddles or weekly updates, keep the team aligned on progress and potential roadblocks
- **Documenting decisions:** Recording process changes, approvals, or lessons learned in a shared system ensures knowledge doesn't get lost when staff rotate or turnover occurs

When communication flows as reliably as the processes themselves, labs can reduce delays, minimize errors, and build trust among team members.

Build continuous feedback loops for process improvement

Even the most carefully designed process will drift over time if not regularly assessed. Building in feedback loops helps managers spot new bottlenecks and continuously refine systems.

Practical approaches include:

- Regular team debriefs to discuss what is working and what is slowing progress
- Dashboards or KPIs that track turnaround time, error rates, and equipment utilization
- Anonymous feedback channels that encourage staff to raise concerns without fear of blame

This continuous improvement mindset—similar to Lean and Six Sigma methodologies—keeps systems aligned with evolving research needs, staffing levels, and compliance requirements.

Shift from firefighting to foresight in lab management

Too often, lab managers spend their days putting out fires: addressing broken equipment, missing samples, or delayed approvals. A systems-focused approach shifts the emphasis from firefighting to foresight.

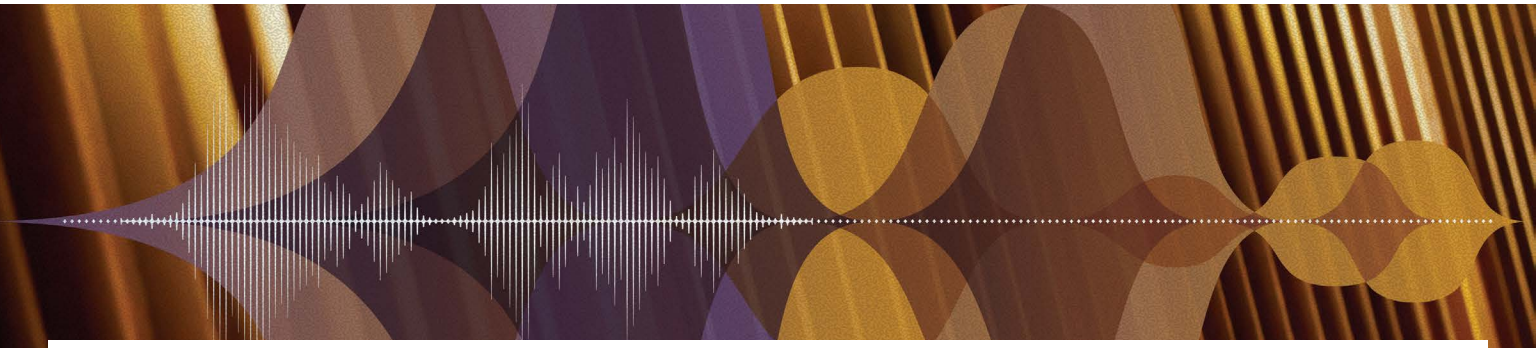
When processes are well designed, common problems become predictable and preventable. Managers can then devote their energy to strategic priorities such as mentoring staff, fostering collaboration, and planning for future research directions.

Conclusion

Productivity in the lab is not about urging people to work harder—it is about creating systems that let them work smarter. By mapping workflows, standardizing processes, leveraging technology, reducing handoffs, strengthening communication, and building feedback loops, lab managers can eliminate bottlenecks and unlock their team's full potential.

Strong systems don't just drive results—they also reduce frustration, improve morale, and create an environment where scientists can do their best work.

Michelle Gaulin *is an associate editor for* Lab Manager. *She can be reached at mgaulin@labmanager.com.*



Sound Decisions: Practical Strategies for Acoustic Control

SMART ACOUSTIC AND VIBRATION STRATEGIES PROTECT BOTH PRECISION TOOLS AND RESEARCHERS **by Robert Lawyer**

For the second time today, the researcher leans back from the transmission electron microscope, squinting watery eyes at unstable resolution marked by image drift and subtle blurring that are inconsistent with the specimen preparation. The equipment is state-of-the-art, recently calibrated—and yet something invisible, something environmental, undermines the precision.

Later, the source is traced to a low, persistent mechanical hum from the air conditioner unit hanging from the floor below. Not loud. Not alarming. Just enough vibration in the floor to ripple through your $2 million instrument.

In most laboratories, acoustic control isn't the first concern. Budget, safety systems, fume hoods, air changes, code compliance, and power needs dominate priority decisions, as they should. Yet in spaces built for precision, the physical force of sound, even when imperceptible, can interfere with instrumentation, data fidelity, communication, and the concentration of those doing the work. Sensitive lab equipment, including electron microscopes, spectrometers, and analytical balances, can be affected by very small mechanical vibrations.

Poor acoustic environments can also elevate stress, fatigue, and the likelihood of errors, particularly in labs where complex procedures demand extended focus or verbal clarity between team members.[1] Research in occupational health and environmental psychology has linked chronic exposure to low-level noise with increased cognitive load, diminished short-term memory, and higher error rates.[2] A persistent low-frequency drone can trigger the body's stress response, raising cortisol levels without conscious awareness. A noisy benchtop adjacent to a quiet workstation creates a micro-conflict that plays out throughout the day in muffled distractions and misunderstood instructions.

Acoustics are actually infrastructure, not luxury. For lab managers facing incremental upgrades rather than complete rebuilds, acoustic interventions can offer some of the most cost-effective, high-impact improvements to the research environment.

Sources of noise

Laboratories are often noisy environments. Well-designed spaces still contend with the continuous background hum of mechanical systems, equipment operation, and human activity. Understanding the primary sources of these noises and their acoustic and vibrational characteristics is the first step in mitigating their impact.

Mechanical systems are among the most pervasive contributors to noise. HVAC systems, with duct-borne turbulence, fan motors, and dampers, generate a combination of airborne noise and structure-borne vibration that resonates throughout a building. Variable air volume boxes, chilled beams, and terminal units can emit noise with lower-frequency sound waves that can travel long distances and excite structural elements, such as floor slabs and wall assemblies.

Laboratory equipment is also a persistent source. Centrifuges, vacuum pumps, shakers, incubators, and chillers all generate varying degrees of noise and vibration, particularly when operating at high speeds or during startup and

shutdown cycles. While many instruments are internally isolated, their performance can still be affected by external vibration transmitted through benchtops, casework, or the building structure itself. Equipment that vibrates with repetitive motion can amplify resonances when placed on casework or on concrete floors.

Human-generated noise can become problematic in tightly packed laboratory environments. Foot traffic, conversations, dropped tools, rolling carts, and office-adjacent areas with open, unaddressed acoustics contribute to a fluctuating baseline that can interfere with understanding speech and sustained focus. In open-plan or interdisciplinary labs, this type of noise is often the most difficult to control without targeted intervention.

Construction and renovation activity, even in adjacent or remote areas of a building, is a potent and underestimated source of acoustic disruption. Temporary vibration from core drilling, jackhammering, and floor preparation can interfere with sensitive instrumentation or cause drift in microscopes. Even minor renovations, such as installing casework, reconfiguring utilities, or anchoring equipment, can transmit through walls and slabs, especially in older buildings that lack modern isolation or damping materials. In shared-use research facilities, the scheduling and phasing of construction work must be coordinated to minimize disruptions to sensitive equipment operation and data collection.

It's the vibe—vibration matters more than decibels

In some labs, it is not the sound you hear but the motion you feel that matters. Equipment such as atomic force microscopes, high-resolution transmission electron microscopes, and ultra-microbalances can be disrupted by vibration levels well below human perception. These instruments often have specified vibration tolerance thresholds measured in microns or micro-g per second. To meet these criteria, labs may require instrument-specific isolation tables, often with pneumatic or active vibration-damping systems. If it is a new facility, dedicated, isolated slabs structurally separated from the central floor system will give users a significant advantage.

Also, laboratory managers should consult the manufacturer's vibration criteria and consider commissioning a vibration analysis during planning or renovation.[3]

Design considerations for noise control

Effective acoustic control requires strategic planning that considers the interplay between architectural building elements, equipment placement, material selection, and user workflow.

1. Material selection: Surfaces that reflect sound, such as glass, painted drywall, and metal, amplify reverberation and echo. Incorporating absorptive materials such as acoustic ceiling tiles, perforated panels

with mineral wool backing, or soft-backed wall panels can significantly reduce sound energy within a room.

2. Zoning and adjacencies: Noisy equipment rooms should not share walls or floors with vibration-sensitive spaces. Acoustically zoning high-decibel activities away from quiet workstations is a powerful design tool that can often be implemented by reassigning functions without altering the building envelope.
3. Structural isolation: Where feasible, equipment should be mounted on vibration-damping platforms or isolated slabs. Floating floors, resilient channels, and neoprene pads can all help decouple equipment-induced vibration from the surrounding structure.

Voices carry

Human voices are one of the most variable and complex noise sources to manage. In open bench labs or shared office-lab hybrids, conversation and movement can lead to reduced concentration, lost productivity, and errors.

Strategies include:

1. Sound-masking systems, which introduce a low-level broadband background noise to reduce speech intelligibility
2. Acoustic partitions should be used between shared workstations whenever possible
3. Soft flooring or mats to reduce footfall noise

Key aspects of room acoustic engineering

The primary goal, informed decisions by lab designers, engineers, and acoustic experts, is to control sound and vibration generated by building systems, equipment, and other sources, as well as to manage sound transmission through building elements. The acoustics criteria include:

- **A-weighted decibels (dBA):** A measure of sound level in an octave band
- **Noise criteria (NC):** A system that rates sound levels across a range of frequencies
- **Room criteria (RC):** A more advanced method developed from noise criteria, providing a numerical value and a quality rating that addresses low and high-frequency annoyance and considers speech communication

Cost-conscious upgrades

Acoustic upgrades do not need to be expensive or disruptive. Many improvements can be implemented as part of routine facility updates:

- Bundle acoustic upgrades with planned MEP or other infrastructure updates, such as replacing ceiling tiles with alternatives that have a high noise reduction coefficient rating during lighting or HVAC renovations
- Add wall-mounted acoustic panels in offices, break rooms, and open bench zones; remind your designers also to consider other factors, such as cleanability and fire resistance, where necessary
- Install vibration isolation pads under pumps, chillers, and shakers during equipment replacement and maintenance; or install them inside purpose-built isolation cabinets
- Upgrade benches or casework from hollow metal to heavier materials where possible, even decouple benches from partitions or shared building framing; add sound-absorbing mats or liners to cabinetry

Quiet investment

Well-managed acoustics in labs support better science. Quieter labs reduce stress, improve communication, preserve data integrity, and foster sustained concentration. Acoustic improvements represent a high value for laboratory managers tasked with stretching every dollar while maintaining performance, and are a low-disruption strategy with immediate human and operational returns. Treat the sound like you treat air, water, or power: not optional, but fundamental.

Robert Lawyer *is a laboratory design architect with over 30 years of experience in design and architecture, specializing in the planning of highly complex laboratory and research facilities, as well as healthcare environments.*

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The Growing Role of Customer Experience

PROACTIVE SUPPORT, TRANSPARENCY, AND COLLABORATION OFFER A STRATEGIC ADVANTAGE AS LABS FACE INCREASING DEMANDS

***Susanna Baqué, PhD**, began her career as a researcher and professor at the University of Barcelona. With over two decades of experience in the life sciences industry, Susanna brings deep expertise and passion to everything she does, from leading sales and support teams to shaping global strategy. Since starting as a CX leader at SCIEX in 2014, she has helped redefine how SCIEX supports scientists by building customer-centric teams. Susanna is the winner of the 2025 Inspiring Women in CX Award in the "Culture" category and a multiple finalist for the "CX Leader of the Year" award.*

Celebrated annually in October, Customer Experience (CX) Day highlights the importance of customer-centric business practices. As part of CX Day 2025, *Lab Manager* spoke with Susanna Baqué.

Q: What defines a great customer experience, and why is this important in today's lab environment?

A: A great customer experience is seamless, personalized, and empowering, built on a deep understanding of each customer's unique needs. Scientists face increasing demands around speed, accuracy, and compliance. They don't just need reliable products; they need responsive partners who provide value at every touchpoint. That's why, to me, a great customer experience begins with listening: proactively gathering feedback and using those insights to continuously improve.

Transparency and ethical practices are also essential. Lab managers expect providers to operate responsibly, sustainably, and with integrity. Being open about our processes and commitment to ethical operations helps foster trust. As technology continues to evolve, it's also critical to maintain a human element. The moments that matter most to customers are those that demonstrate empathy and evoke positive emotions.

In essence, a great customer experience enables scientists to focus on what matters most to them, which is their science.

Q: In recent years, how have the needs and expectations of analytical labs evolved?

A: Lab needs have evolved due to increasingly complex workflows, accelerated timelines, and growing regulatory demands. Labs are expected to deliver more data, with greater accuracy, in less time. This is driving demand for a more connected, automated, and data-driven environment. Customers now expect more than high-performing instruments. They want end-to-end solutions that integrate smoothly, minimize downtime, and simplify data management.

Beyond technology, lab managers expect more collaborative and personalized relationships. They're choosing partners who not only provide advanced technology but also demonstrate transparency, accountability, and a commitment to delivering an exceptional customer experience.

Q: How does SCIEX gather and implement customer feedback to improve services or develop new tools?

A: For us at SCIEX, customer feedback is the foundation of how we innovate and deliver value. We've implemented a comprehensive feedback loop that supports improvements to our products as well as the quality of our services and support.

We take a holistic approach to gathering feedback, capturing it from a variety of channels, including customer surveys, advisory boards, interviews, and focus groups. Gathering feedback is not a one-time action; it's a continuous cycle of listening, learning, improving, and then communicating with customers. It not only ensures that we remain agile, relevant, and responsive but also builds trust when customers see their feedback in action.

The most important thing is not only to gather the feedback but to review it regularly and use it to make actionable improvements. One example of this is our SCIEX Now portal, which was initiated in direct response to customer feedback and has since evolved to include a range of tools that support and empower our customers.

Q: As a leader in customer experience, what has been your most memorable achievement so far?

A: One of the most memorable achievements was the launch and continuous evolution of our customer portal, SCIEX Now. We introduced it about 10 years ago in response to customer feedback seeking a centralized, user-friendly digital experience for managing interactions with us. Rather than building a one-time solution, we took a customer-centric approach, designing the portal around user needs and embedding tools to gather ongoing feedback.

Since then, SCIEX Now has evolved into a robust platform, offering case management, instrument and software management tools, as well as a learning hub featuring a wide range of courses and structured learning paths.

What makes this meaningful to me is how it has evolved in response to user input. It's a living example of how customer experience is a mindset and how it can drive long-term value and trust.

Q: What's one thing you wish more lab managers knew about getting the most out of their service experience?

A: I wish more lab managers recognized the value of proactively engaging with the whole ecosystem of support and learning tools available to them, not just when something goes wrong. Service is no longer just fixing issues; it's about preventing them, optimizing system performance, and empowering teams with the knowledge and tools they need to work more effectively.

This proactive approach helps avoid downtime, improves compliance readiness, and increases the overall return on investment. Viewing service as an ongoing partnership, rather than a one-time transaction, leads to better collaboration, which is a win-win situation for lab managers and their teams.

Q: Looking ahead, where do you see customer experience headed, and how can lab managers prepare?

A: Customer experience is becoming more predictive, personalized, and integrated. Advances in technology are allowing us to move from a reactive to a proactive model.

But the future isn't just tech-enabled, it's also human-centered. Lab managers still rely on human expertise and value the empathy and relationship-building that come from these interactions. The best experiences will merge digital and human experiences. Another key trend is the growing importance of shared values, like sustainability, data security, and ethical practices. Lab managers are increasingly choosing partners who align with their values and operate with transparency.

To prepare, lab managers should leverage digital platforms more strategically—not just when something goes wrong, but also for planning, performance tracking, and upskilling their staff. Staying curious about new service models and technologies will be key in this rapidly evolving landscape.

For me, customer experience has become a strategic differentiator. Those who embrace it, whether lab managers or solution providers, will be better positioned for long-term success.

Q: What inspired SCIEX to participate in CX Day, and how are you marking the occasion this year?

A: We see customer experience as something that should be at the heart of everything we do, and that the whole company is accountable for providing the best possible experience. We started celebrating CX Day in recent years to honor the people and the partnerships that make our outstanding customer experiences possible.

This year, we're planning activities to thank both our customers and the employees who support them. We'll host internal celebrations at our main office sites, creating those moments of recognition and appreciation. We're also engaging our global network of CX ambassadors to help communicate—both internally and externally—why customer experience matters and how it's brought to life across our organization.

CX Day is not only a celebration but also an opportunity to reaffirm our commitment to a customer-first mindset. By celebrating our progress and recognizing those who make it possible, we build and foster a culture that drives both customer loyalty and employee pride.

To learn more, visit community.sciex.com/cx

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Conducting a Chemical Risk Assessment in the Laboratory

AN OVERVIEW OF THE CRITICAL STEPS TO CARRYING OUT A SUCCESSFUL CHEMICAL RISK ASSESSMENT **by Dan Scungio, MT (ASCP), SLS, CQA (ASQ)**

Most laboratories, whether clinical, research, or industrial, contain a wide array of chemicals. These chemicals are essential for operations but also pose potential risks to personnel and the environment. A well-structured chemical risk assessment ensures that laboratories maintain a safe working environment while complying with the Occupational Safety and Health Administration (OSHA) regulations and other safety standards. Performing a chemical risk assessment involves several critical steps: evaluating chemicals and reagents, utilizing chemical inventories as a risk assessment tool, and assessing the effectiveness of the laboratory's chemical hygiene plan (CHP). The use of these assessment tools will help create a safer overall lab environment.

Evaluating chemicals and reagents

The foundation of a strong chemical risk assessment is a thorough evaluation of all chemicals and reagents used in the laboratory. This process involves understanding the hazards associated with each substance and determining the necessary controls to mitigate any accompanying risks. This evaluation can be performed by using a stepwise process.

First, the laboratory should review their chemical safety data sheets (SDS). OSHA's Hazard Communication Standard (HCS - 29 CFR 1910.1200) mandates that laboratories maintain up-to-date SDSs for all hazardous chemicals. The SDS provides crucial information on:

- Chemical composition and properties
- Potential health hazards
- Storage and handling precautions
- First aid and emergency procedures
- Personal protective equipment (PPE) requirements

Since the United States adopted the Globally Harmonized System for Hazard Communication in 2012, chemical manufacturers now generate a standardized, sixteen-section SDS for every hazardous product made. That makes it easier for labs to evaluate these documents in an orderly fashion. Lab personnel should review SDSs regularly to ensure that all staff are familiar with the hazards of the chemicals they work with daily.

Continue the evaluation by identifying hazard categories that apply to each chemical class or category. Chemicals should be categorized based on their primary hazards:

- Flammable (e.g., ethanol, methanol, acetone)
- Corrosive (e.g., hydrochloric acid, sodium hydroxide)
- Reactive (e.g., peroxides, sodium metal)
- Toxic (e.g., formaldehyde, benzene)
- Carcinogenic or mutagenic (e.g., ethidium bromide, acrylamide)
- Reproductive toxins (e.g., mercury, toluene)

Grouping chemicals based on hazards allows the lab to implement appropriate safety measures. These measures can include special handling procedures, designated storage areas, the use of specialized engineering controls (such as chemical fume hoods), and PPE.

Next, an assessment of the safe handling procedures for all chemicals used in the laboratory must be completed. Proper handling of chemicals is vital to prevent accidents. Comprehensive chemical procedural risk assessments should evaluate:

- The potential for spills, splashes, or vapor release
- Engineering controls (e.g., fume hoods, ventilation systems)
- Proper transport methods (e.g., secondary containment)

- Compatibility with other substances to avoid dangerous reactions

Once this portion of the chemical risk assessment is completed, the laboratory can establish or modify the CHP to include the safety measures that apply. At this point, specific spill kit types can be purchased and placed in appropriate locations. An analysis of the location of emergency eyewash stations and showers should also occur at this step of the process.

Utilizing chemical inventories as a risk assessment tool

A comprehensive and up-to-date chemical inventory, while required by regulations, also serves as a critical tool in the total risk assessment process. A complete inventory helps the laboratory track chemical quantities and expiration dates. Regular inventory audits help ensure that expired or degraded chemicals, which may become unstable or hazardous, are removed promptly. Inventory management also prevents the overstocking of chemicals, which reduces unnecessary exposure risks.

Chemical inventories are also useful for identifying high-risk chemicals in the lab. By analyzing the chemical inventory, lab managers can pinpoint substances that require additional precautions, such as highly reactive agents or known carcinogens. This enables targeted safety interventions, such as limiting the volume of hazardous chemicals stored onsite or requiring additional training for handling certain substances.

The inventory can also help the laboratory manage chemical storage and segregation. A well-maintained inventory helps enforce proper storage practices by:

- Ensuring flammable chemicals are stored in approved flammable storage cabinets
- Keeping acids and bases in separate, dedicated storage areas near the floor
- Preventing incompatible chemicals from being stored together (e.g., oxidizers away from organic solvents)
- Confirming proper labeling and hazard communication compliance

An effective chemical inventory system, whether paper-based or digital, enables real-time tracking and rapid access to hazard information, making it an invaluable component of laboratory risk assessments.

Keeping chemical safety a priority

The laboratory is a dynamic environment. Processes and instrumentation change often, and the chemicals in use will not remain static. Therefore, a chemical risk assessment cannot be a one-time event; it's an ongoing process that requires vigilance, training, and adaptation. By systematically evaluating chemical hazards, maintaining an accurate chemical inventory, and regularly reviewing the effectiveness of the CHP, laboratories can foster a culture of safety and compliance.

When was the last time your lab performed a full chemical risk assessment? If it's been a while, now is the perfect time to start. Safe chemical management isn't just about compliance—it's about protecting the health and well-being of every person working in the lab. Stay proactive, stay informed, and stay safe!

Dan Scungio, *MT (ASCP), SLS, CQA (ASQ), has over 25 years of experience as a certified medical technologist and a bachelor's degree in medical technology from the State University of New York at Buffalo. As a laboratory safety consultant and a safety officer, Dan provides on-site education and safety training for labs of all sizes with a mission to help organizations create safety-savvy laboratories.*

EVALUATING THE EFFECTIVENESS OF THE LABORATORY'S CHP

The CHP is the laboratory's guiding document for chemical safety, and its effectiveness must be evaluated at least annually to ensure it meets OSHA's requirements and protects lab personnel. There are various methods that can be employed to analyze the plan's effectiveness:

1. Conduct regular laboratory safety audits that include chemical hygiene practices:

Routine safety audits help identify gaps in the CHP. Audits should include observations of chemical handling and storage practices, a review of engineering controls (e.g., fume hood functionality tests), and an assessment of emergency preparedness, including spill response capabilities.

2. Review lab chemical incident and exposure reports:

Past incidents provide valuable lessons for improving safety protocols. Reviewing exposure records, near-miss reports, and accident logs can reveal recurring safety concerns that require corrective actions.

3. Deliver training on chemical safety:

A CHP effectiveness assessment should evaluate whether staff receive initial training on the plan and chemical handling procedures. Ongoing education should include annual refresher courses on hazard communication as well as hands-on spill response and emergency procedures training. Spill drills should also be routinely performed to ensure staff readiness for a chemical release incident. A successful training program ensures that lab personnel understand the risks associated with their work and know how to mitigate them.

4. Evaluate PPE compliance to assess effectiveness

PPE is the last line of defense against chemical hazards. Check for the availability and proper use of gloves, lab coats, goggles or face shields, and respirators. Gauge the appropriateness of PPE used for specific chemical hazards (e.g., selecting chemical-proof gloves for solvent use), and ensure the maintenance and replacement schedules for PPE used in the lab.

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How Targeted NGS Helps Translational Labs Go Hands-Free

MANUAL PROCESSING OF SAMPLES CAN BURDEN LAB PRODUCTIVITY. THE INNOVATIVE MAGNIS SYSTEM AUTOMATES THE PROCESS ACROSS RESEARCH FOR CANCER, INHERITED DISORDERS, AND INFECTIOUS DISEASE

*◂**Bellal Moghis**, director of genomics product management at Agilent Technologies, explains how automation is reshaping targeted next-generation sequencing (NGS) workflows—from inherited disease panels to cancer panels—by making library prep more consistent and accessible*

Q: Why do labs still rely on targeted NGS as whole-genome options expand?

A: There's a reason it hasn't been replaced. By focusing only on regions of interest, targeted NGS reduces sequencing, storage, and analysis costs. It also improves sensitivity and reproducibility—key for assays involving low-input or degraded samples. These benefits have made it a billion-dollar market, with growing adoption across translational research labs.

Q: What are the pain points of running targeted enrichment?

A: Target enrichment helps labs focus their sequencing resources on genome regions where coverage matters most. Instead of scanning the whole genome, they concentrate on specific genes or variants tied to disease. Agilent helped pioneer this approach more than a decade ago with its SureSelect platform, which now underpins thousands of published studies across cancer, inherited disorders, and infectious disease.

The chemistry isn't the problem. It's the process. A typical manual library-prep and target-enrichment workflow can eat an entire eight-hour shift. You're pipetting every step, staying vigilant. And in labs with tight turnaround or rotating staff, that's hard to sustain.

Sequencing keeps getting faster, and though targeted enrichment protocols have shortened overtime, the process is still manual and skill-dependent.

Q: What is the Agilent Magnis NGS Prep System?

A: The Magnis system automates the entire SureSelect prep workflow, from DNA or RNA to sequence-ready library, with about twenty minutes of hands-on time. Labs load their plates, start the run, and let it finish without interruption. The system handles custom and catalog panels across several sample types including FFPE samples and liquid biopsy.

Other automation platforms may still require some manual steps or take up bench space with large-footprint instruments. Magnis was built differently. It delivers consistent prep across sample types with a compact design conducive to labs of all sizes.

For labs under pressure to reduce turnaround time or onboard new staff, the value is simple: a repeatable process that's easier to run. Whether the input is cfDNA, FFPE, or high-quality gDNA or RNA, the system processes these samples on the SureSelect panel of your choice.

Q: What specific problems does Magnis solve in traditional NGS workflows?

A: Labs running oncology, inherited disease, or infectious-disease assays for research purposes often face pressure to reduce turnaround and maintain consistency across samples and staff. Magnis supports those goals by removing variability from the targeted enrichment process. Each run follows the same protocol, regardless of operator or sample type. That helps labs shift from

outsourced or high-skill prep toward a more standardized, in-house approach.

Q: Why does automation matter more in assays like liquid biopsy and FFPE?

A: Liquid-biopsy and FFPE samples often contain very little DNA, which is a challenge as often these samples are associated with applications that require high sensitivity. User errors or imprecise processing of samples can impact sensitivity, therefore an automated system that minimizes, and even eliminates errors, can help maintain high sensitivity.

The Magnis runs the full SureSelect protocol without interruptions. No mid-run handling means less chance of sample loss, and each run follows the same conditions regardless of who starts it. That level of control supports consistent performance in assays such as tumor profiling, where input is limited and sensitivity is critical for variant detection.

Q: Where does Magnis fit in labs already using SureSelect panels?

A: Magnis runs both catalog and custom SureSelect panels, covering applications from whole exomes to focused tumor assays. Most labs already using SureSelect chemistry can run the same panels on the Magnis system using the same enrichment logic in an automated format.

Some labs run the Magnis system alongside the Bravo system Agilent's high-throughput liquid-handling platform. The Bravo system handles large batch samples, while the Magnis system supports scenarios where labs may not want to wait for large batches to accumulate.

One group, for example, is building a pan-hematologic panel on the Magnis system, intended to meet CAP/CLIA and New York State requirements. That kind of setup gives smaller labs access to automated enrichment workflows without building them from scratch.

Q: How do labs integrate new panels into automated enrichment workflows?

A: Custom panels are user-defined designs produced by Agilent, letting labs target any gene set without changing the automated workflow.

While the content menu of the Magnis system continues to expand, so are the capabilities. Agilent will soon offer the new Avida liquid biopsy chemistry with methylation capabilities on the Magnis system.

Similar to SureSelect, the Magnis system will enable full automation of the Avida chemistry, allowing labs to not only detect DNA variants in liquid biopsy samples but also methylation variants that help provide additional insights.

Q: What advantages does targeted NGS offer as whole-genome sequencing becomes more common?

A: Whole-genome sequencing is expanding, but targeted enrichment still offers key advantages in performance and usability. Focused panels deliver higher coverage of relevant regions, faster turnaround, and less downstream complexity. That's especially important in somatic assays, where the goal is to detect low-frequency mutations in a small amount of DNA. Sequencing a narrow region more deeply improves the chance of finding those variants—something broad, shallow genome scans may miss.

As automation improves access, enrichment becomes easier to standardize and scale. Panel menus continue to grow, including support for liquid biopsy and methylation. With consistent prep and evolving content, targeted workflows remain a practical fit for labs that need sensitivity, speed, and control.

Q: What defines success in targeted NGS today?

A: Informatics is where it all comes together. Even with good chemistry, you won't get answers without the right pipeline. Success means aligning front-end prep with back-end analysis—hard to do, but when it clicks, that's the reward.

For Research Use Only. Not for use in diagnostic procedures.

The MagnisDx NGS Prep System is for In Vitro Diagnostic Use.

Fewer Government Resources—Now What? Join Peer-Led Safety Communities

DISCOVER HOW PEER-LED LAB SAFETY GROUPS HELP RESEARCHERS STAY PROTECTED, INFORMED, AND CONNECTED—EVEN AS NATIONAL SAFETY FUNDING DECLINES **by Anthony Appleton, PhD**

We are in a time when government resources related to research and safety are being reduced. These cuts will directly or indirectly affect safety resources for research across the United States. A contact or program may no longer be available at state and/or federal agencies. The cuts may even cause layoffs of safety-related people and resources where you work. For instance, CNN reported that two-thirds of the staff of the National Institute for Occupational Health and Safety—equaling about 870 workers—were cut in a sweeping reduction to federal health agencies.[1] With these cuts, these agencies will be losing a lot of expertise that would have otherwise been disseminated to labs.

What can lab managers, researchers, and those involved with laboratory safety do to maintain access to this critical information?

They can join a peer-led lab safety community.

These peer-led groups are made up of thousands of researchers, lab managers, and others who have a tremendous amount of knowledge they are willing to share. Here are three such organizations:

- The American Biological Safety Organization (ABSA) International
- The American Chemical Society (ACS)
- The Campus Safety & Environmental Management Association (CSHEMA)

Below are quotes from the leadership of ABSA International, ACS, and CSHEMA that highlight the benefits of being part of a peer-led lab safety organization:

Sherry S. Bohn, PhD, MSL, CBSP, executive director of environmental health and safety at the University of Maryland and president of ABSA International:

"For those new to the profession, we offer numerous educational opportunities designed to build a strong foundation in biosafety and biosecurity. Our mid-career members benefit from extensive networking opportunities and challenging, timely professional development programs that keep them at the forefront of industry advancements. Senior-level professionals find a platform to mentor, consult, and shape the future of the profession, leveraging their expertise to guide the next generation. In a time when government resources for lab safety are declining, ABSA International stands out with peer-led resources that support and enhance laboratory safety practices. Our community-driven approach ensures that members have access to the collective knowledge and experience of their peers, fostering a collaborative environment that promotes excellence in biosafety and biosecurity."

Rigoberto Hernandez, PhD, professor at Johns Hopkins University and ACS president-elect:

"Chemical safety is the one advance that you rarely hear about because when all goes well, it doesn't make the news. Nevertheless, chemical production and advances in chemistry have relied on a safety culture, where safety is everyone's responsibility. Not only does doing so reduce the risk of accidents, it also mitigates their consequences as everyone is prepared to respond. ACS offers many resources to support and foster a safety culture. I encourage you to engage with us through your ACS membership. Doing so is at the heart of peer-led efforts advancing safety."

Mary Lindstrom, program manager of environmental health and safety at Harvard and vice president of CSHEMA:

> "CSHEMA, the leading association focused on enhancing safety, health, and environmental management in higher education, serves everyone interested in campus safety. Our Lab Safety Awareness Week, every February, delivers key resources to elevate lab safety practices at participating institutes. We offer professional growth and networking opportunities through an annual symposium and conference, alongside Communities of Practice (CoPs) that connect individuals with shared interests, such as lab safety, through online forums and regular virtual meetings. Institutional membership enables anyone from member institutions to join at no extra cost, regardless of their role, accessing online forums, CoP meetings, discounted events, and webinars focused on the latest industry standards and innovations."

Join your peers in one or more of these organizations so that you can maintain an appropriate standard of laboratory safety, have access to thousands of your peers who are willing to share their knowledge, as well as improve your skillset in a variety of areas to serve your organization better and enhance your career.

In addition, the Lab Manager Academy offers a full Lab Safety Management Certificate backed by 12 self-paced courses across risk, safety culture, and technical safety topics.

In the words of Marcus Aurelius, "Whenever you have trouble getting up in the morning, remind yourself that you've been made by nature for the purpose of working with others."

***Anthony Appleton**, PhD, recently retired. He was the leader of Colorado State University's Research Safety Culture Program, which won three national awards for marketing and communications. Anthony has co-authored 20 peer-reviewed articles. He was also a member of Stanford's University Committee on Health and Safety's (UCHS) Task Force for Advancing the Culture of Laboratory Safety, which generated the influential report "Advancing Safety Culture in the University Laboratory."*

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Safety Meets Security: A Wake-Up Call for Laboratory Leaders

UNDERSTAND LAB SECURITY ESSENTIALS, INCLUDING INVENTORY CONTROL, ACCESS LOGGING, AND CYBERSECURITY MEASURES **by Lauren Everett**

Laboratories are uniquely complex environments where safety and security concerns intersect in critical ways. The convergence of chemical, biological, radiological, and physical hazards in a single workplace presents risks unlike those found in most other settings. For lab managers, understanding and addressing this complexity requires not only comprehensive safety protocols but also an evolving appreciation for security threats.

> "Laboratory managers are often tasked with maintaining high standards of safety, but it's just as crucial that security be embedded into everyday lab culture, too."

Robert Emery, a leading expert in laboratory health and safety with over 40 years of experience and multiple national certifications, emphasizes the need for lab leaders to expand their thinking beyond traditional safety measures. Emery serves as vice president for safety, health, environment, and risk management at the University of Texas Health Science Center at Houston.

According to Emery, one of the most important distinctions lab managers should understand is the difference between safety and security. While lab safety focuses on preventing unintentional harm through engineering controls, training, and protective equipment, security often deals with intentional threats—acts of sabotage, theft, or violence that may originate from within or outside the organization. Emery points out that only in the English language are "safety" and "security" treated as separate concepts; in most other languages, there's a single word for both. This linguistic divide reflects a deeper mindset: safety assumes people are trying to do the right thing while security begins with the possibility that someone may not. Recognizing this distinction is essential for developing a more complete understanding of risk in laboratory environments.

Safety and security: A dual-focused lab culture

"The difference is intent," Emery says. Safety programs are built on the assumption that employees want to come to work, do their jobs safely, and return home unharmed. Security, on the other hand, starts from a place of suspicion. Security professionals must consider the possibility that someone may seek to intentionally cause harm or exploit vulnerabilities.

This subtle but important distinction changes the way risks are assessed and mitigated. For example, safety professionals may view an open manhole as a fall hazard requiring signage and barriers. A security-minded approach, however, would ask whether someone might intentionally push another person into it—or whether someone might use it to gain unauthorized access.

The insider threat: A growing concern

A significant and often overlooked risk in laboratory security is the insider threat. Emery categorizes insider threats into three types:

- **Malicious insiders**, who seek employment with the intent to cause harm (e.g., activists infiltrating labs to disrupt research)
- **Coerced or sympathetic insiders**, who are pressured into harmful actions due to personal or ideological reasons
- **Oblivious insiders**, who unintentionally create security gaps through everyday carelessness or lack of awareness

Most lab personnel fall into the third category. Actions such as propping open doors, sharing access badges, or posting passwords on computer monitors may seem harmless but can significantly undermine facility security.

A simple, actionable insight

Emery encourages lab managers to incorporate one seemingly simple question into their routine safety inspections: *Do you have any safety or security concerns?*

When this question was added to lab walkthroughs at his institution, 80 percent of staff responded, and of those, the majority raised concerns not previously covered by standard safety checklists. These included issues as varied as poor lighting in parking lots and suspicious after-hours activity.

In one case, asking this question uncovered a researcher who was using a lab printer at night to steal proprietary data and mail it overseas. The security breach was discovered only because someone mentioned that the printer was always out of paper in the morning.

Rethinking inventory and access

Another critical area that Emery highlights is chemical inventory management. Traditionally, labs track chemical stocks to assess fire loads or compliance with safety regulations. However, from a security standpoint, inventory should also account for "shrinkage"—a term more commonly used in retail. Regulatory authorities may expect labs to immediately account for missing quantities of hazardous materials, viewing unexplained losses as potential security threats.

Similarly, reviewing access logs should include not only who successfully enters restricted areas but also who attempts and fails to gain entry. Failed access attempts, even when innocent, may signal credential misuse, unauthorized activity, or vulnerabilities in the access system.

Cybersecurity and connected equipment

Emery acknowledges that many lab managers are not trained on cybersecurity, but it is a growing concern. He recommends that lab managers expand their definition of security to include digital vulnerabilities. Internet-connected lab instruments, cloud-based data storage, and external software integrations all pose risks if not properly secured. He warns that many labs are unaware of equipment that has public-facing IP addresses, creating potential points of entry for cyber attackers.

Practical steps for lab managers

Emery offers a set of practical measures lab leaders can adopt to enhance both safety and security:

- **Integrate security awareness into safety training:** Educate staff on recognizing suspicious behavior, protecting data, and securing access points
- **Ask staff about safety and security concerns:** Make this a regular part of walkthroughs and create clear channels for reporting
- **Inspect labs after hours:** Assess lighting, access, and potential vulnerabilities that may not be visible during daytime operations
- **Monitor failed access attempts:** Regularly review logs for unsuccessful badge-ins and investigate anomalies
- **Coordinate terminations with security protocols:** Ensure that badge access and login credentials are revoked promptly when staff leave
- **Treat chemical inventory as a security function:** Know what substances are stored, where, and in what quantities—and track them in real time

Laboratory managers are often tasked with maintaining high standards of safety, but it's just as crucial that security be embedded into everyday lab culture, too. The risks posed by insiders, cyber threats, and unintentional oversights demand vigilance, structured protocols, and an understanding of how safety and security differ—and how they overlap.

By adopting a more holistic approach, lab leaders can better protect their people, research, and reputation—while fostering a culture of awareness and accountability.

***Robert Emery** delivered a presentation on the topic of laboratory safety versus security earlier this year at the 2025 Lab Manager Leadership Summit. Visit summit.labmanager.com/leadership to learn about the 2026 Leadership Summit in Phoenix, AZ.*

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Breaking the Cycle of Improvised Solid Sample Prep

VALIDATED MILLING DELIVERS REPRODUCIBLE PARTICLE SIZE, ACCURACY, AND AUDIT-READY RESULTS

◂ ***Melissa Fauth**, is CEO of Fritsch Milling & Sizing, Inc., the U.S. subsidiary of the German family-owned company. Since opening the office in North Carolina's Research Triangle in 2014, she has overseen its growth as a resource for scientists working with solid sample preparation and particle sizing. Her team supports labs across industries, from pharmaceuticals to aerospace, with tailored milling solutions.*

Q: Why is sample preparation considered the foundation of accurate analytical results and why does it matter so much?

A: Inconsistent preparation risks false positives, failed batches, wasted time, and loss of revenue. Most errors occur before the instrument is even loaded with a sample. What you feed the instrument has a significant impact on the results that follow. As part of an SOP, sample preparation prior to instrumental analysis is a critical step that is often overlooked or not identified as important to the process.

However, variability at this stage undermines everything downstream. To ensure reliable data, we need reproducibility, representative samples, and analyte integrity. But few scientists ever receive formal training in sample prep, so they do the best with what they have on hand. It isn't negligence, it's simply that people don't know these solutions exist.

Q: What misconceptions do labs have about sample prep, and what do you actually see in practice?

A: Talk to analytical instrument manufacturers and you'll hear the same message: solid samples must be reduced before analysis. Whether the goal is to create a powder for a tablet, load a crucible for firing, or dissolve a solid into solution, the requirement is universal.

Yet our biggest competitor isn't another brand—it's improvised tools. We walk into top labs and see baggies and hammers, coffee grinders, or bullet blenders pressed into service for quality checks. I've seen PhD scientists grinding difficult materials by hand, in shifts, for days at a time before downstream processing can begin. We have automated mortar grinders that solve this in minutes, but awareness is so low that these options are often overlooked.

The gap is striking because the same labs invest hundreds of thousands of dollars in instruments capable of measuring to five decimal places. If the starting material is prepared with improvised tools, that precision doesn't matter. Once managers see that connection, they stop viewing mills as a luxury and start treating them as a safeguard.

Q: What risks arise from using the 'wrong' tools, like hand grinders, blenders, or non-professional equipment for sample prep?

A: With batch grinding on kitchen-style appliances, friction and excess heat can damage a sample's physical properties and alter the chemical profile through degradation or volatilization. Improvised methods bring other problems too: contamination, unsafe dust, incomplete recovery, even the total loss of material that took weeks to collect. And because the process stops when someone decides it looks 'right,' the outcome depends on personal judgment. Two operators can prepare the same sample and get very different results.

There are also the human risks. Unguarded blades and heavy lifting cause acute injuries. Repetitive grinding leads to strain in wrists and shoulders. EH&S officers see the pattern—recordable incidents that take people out of the lab, reset the board on days worked without injury, and drain productivity. In some cases, it even brings liability.

Most of the time, labs only look for a fix after something has gone wrong: an accident, an audit, or a costly delay. The better path is to start the conversation earlier. Awareness and education give teams a way to eliminate hazards before they happen and protect both the science and the people behind it.

Q: How does equipment choice directly impact reproducibility, reliability, and quality of the lab's results?

A: Sample prep may seem routine, but the choice of equipment directly impacts every downstream result. One repeated challenge we hear about is inconsistency from lab to lab. Today's analytical instruments are extremely sensitive. So why do results still vary?

It isn't one big mistake—it's the accumulation of many small variances. Certified reference materials and ISO/IEC 17025 standards rely on consistent prep. Professional mills make it possible to create SOPs that can be validated, which eliminates operator bias and technique drift. That's how reproducibility is achieved and audits are passed.

And while improvised tools may look inexpensive at first, they rarely save money. A false positive or failed batch can hold up millions of dollars in raw material. A recall or disposal multiplies the loss. Purpose-built mills may carry a higher upfront price, but they prevent waste, protect staff, and deliver reproducibility that pays for itself many times over.

Q: How can better sample prep improve efficiency, reduce waste, and strengthen business outcomes?

A: Better prep shows its value on the business side. Strong systems cut variation and standardize output, which reduces delays and rework. Precision mills control particle size, homogenize material, and manage temperature so every sample stays representative.

They also protect the instruments that follow. Poorly prepared material can clog lines and cause abrasion that shortens component life, leading to premature failure. Preventing that damage keeps performance steady and lowers operating costs across the lab..

Q: Given that solid sample prep is rarely taught in school, how can labs raise their standards in practice?

A: That's a very common challenge. Sample prep is often learned by word of mouth or habit rather than best practice. The solution is to formalize training with SOPs, validated methods, and, where possible, easy to program controls that reduce operator variability.

At Fritsch, we partner with labs to support that process. From proof-of-concept trials and method development resources, to training sessions online or in your facility, we focus on your exact needs. Our role is not only to provide the most ideal equipment but also to help labs modernize and standardize their preparation practices so they can achieve their goals and continuous improvement objectives.

It helps to start with the material itself. Is it hard, brittle, ductile, oily, fibrous, or moist? Each property requires a different approach. Fritsch's portfolio of crushers, disk mills, planetary mills, rotor, cutting, and knife mills—along with cooling options—lets labs match each sample to the instrument best suited to it. Reproducibility then becomes built in, independent of the operator. That's the benefit that unlocks all others.

Q: How do modular design and long-term support change the value equation for labs?

A: Many labs are surprised by how adaptable our systems are. With more than 3,000 interchangeable parts, a single mill can be configured to handle a wide range of materials. As needs evolve, you can update components rather than replace the instrument.

That flexibility extends asset life and reduces waste. We still support instruments purchased decades ago—including one from 1974 that's still in service. For lab managers, that means stability: one investment that adapts as materials, methods, and compliance demands change.

This isn't a one-time transaction. It's a long-term relationship that carries through the life of the instrument and keeps labs productive and compliant well beyond the initial purchase.

Q: Where do you see the biggest opportunities for labs to strengthen their prep practices in the years ahead?

A: I think the biggest opportunity is awareness. Many labs still don't recognize how much variability originates before the instrument. As new regulations emerge—whether on contaminants, pharmaceuticals, or environmental safety—prep will only grow more critical.

Labs that invest now in validated, reproducible prep will be ahead of the curve. They'll spend less time troubleshooting, less money on reruns, and less effort on compliance. That frees them to focus on what matters most: advancing their science and supporting their organization's goals.

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SIF Risk Prevention Strategies

LAB MANAGERS CAN REDUCE LIFE-ALTERING INCIDENTS BY ADOPTING A PROACTIVE APPROACH TO SIF RISK PREVENTION **by Lauren Everett**

In labs, the risk of serious accidents often develops over time, marked by early warning signs that can be easy to miss. These indicators—known as serious injury and fatality (SIF) precursors—are observable conditions or behaviors that signal elevated risk but frequently go unrecognized or unaddressed.

> "Instead of viewing safety as a shifting priority, leaders should communicate that safety is a core ethical value."

Understanding how to detect and respond to these precursors is one of the most effective ways lab leaders can protect their teams. A presentation delivered by Don Martin, a global expert in SIF prevention, during the 2025 Lab Manager Leadership Summit offered a practical framework for identifying SIF potential, building leading indicators, and shifting safety culture from reactive to proactive.

What follows are key takeaways from the session—insights lab managers can use to elevate their safety programs, engage staff, and strengthen their organization's defenses against the worst-case scenarios.

Understand and identify SIF precursors

Martin introduced the concept of SIF precursors: observable conditions or behaviors that, if left unaddressed, can lead to a life-threatening or life-altering event. These precursors are typically detectable before an incident—but too often, no one recognizes them.

For lab professionals, precursors might include missing personal protective equipment (PPE), faulty fume hoods, or risky behaviors that go uncorrected. Martin emphasized the need to study near misses and recordable injuries to uncover patterns that reveal underlying SIF potential. According to his research, 25 percent of such cases show that only one small change would have resulted in a fatal or life-altering outcome.

Build a portfolio of leading indicators

Rather than waiting for incidents to occur, lab managers should prioritize leading indicators—measurable actions that are within the team's control and predictive of safety outcomes. Martin suggests tracking:

- The number of near misses reported, particularly those with SIF potential
- The presence and performance of critical controls
- The frequency and intensity of high-risk exposures (e.g., working with high voltage or hazardous chemicals)

These indicators can help construct tools like a SIF Pareto chart to guide where safety resources should be focused.

Make critical controls visible and non-negotiable

A critical control, Martin explained, is a behavior or condition that must be in place 100 percent of the time to prevent serious harm. In a lab, this could include working fume hoods, emergency eye wash stations, arc flash protection, and appropriate PPE.

"If a critical control is missing or underperforming," he said, "the only conclusion you can draw is that the person's life is in jeopardy. You must stop the job."

Lab managers must verify—not assume—that these controls are in place and functioning. Field verifications and checklists must move beyond transactional compliance to transformational engagement.

Engage leadership through SIF-focused metrics

Martin noted that many executive teams don't know their organization's vulnerability to SIFs, nor do they track exposure frequency or verify the presence of critical controls. To address this, he recommends reframing safety conversations around:

1. **Vulnerability to SIF events:** What portion of reported incidents could have resulted in a fatality?
2. **Exposure to SIF risk:** How often are lab workers performing high-risk tasks?
3. **Critical control verification:** What evidence proves safety systems are in place and performing?

When leaders are shown data, they become more engaged and willing to invest in prevention through design and system-level changes.

Move beyond checkboxes: Make safety conversations real

Martin challenged lab managers to transform routine safety activities like pre-task briefings and observations into conversations that engage teams meaningfully. Instead of simply checking forms, ask workers:

- What are you doing today?
- How could you get hurt or killed?
- Do you have everything you need to protect yourself?

This kind of engagement fosters ownership, reveals gaps in understanding, and builds trust. It also strengthens "stop work authority"—a critical safety mechanism that allows workers to pause unsafe work without fear of retaliation.

Shift the culture from compliance to care

Safety culture, Martin emphasized, isn't built on rules alone—it's built on values. Instead of viewing safety as a shifting priority, leaders should communicate that safety is a core ethical value.

He offered several reframes to shift the culture:

- From rules to commitments: Replace rigid rules with personal commitments to protect yourself and others
- From compliance to ownership: Encourage reporting and learning rather than punishing mistakes
- From investigation to learning: Swap blame-based investigations for root cause analysis that leads to meaningful, system-level fixes

Martin also stressed the role of psychological safety in empowering workers to speak up about risks. When leaders ask better questions and show genuine curiosity, workers respond with honesty—and that honesty saves lives.

Start small, but start now

Martin concluded by encouraging labs to select just one or two leading indicators to begin with—such as tracking near misses with SIF potential or verifying critical controls during lab walkthroughs.

> "If a critical control is missing or underperforming, the only conclusion you can draw is that the person's life is in jeopardy. You must stop the job."

His message to lab managers was clear: serious injury and fatality prevention isn't just a technical challenge. It's a leadership responsibility, a cultural shift, and a long-term commitment to creating a safer, more resilient lab environment.

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Lab Manager ACADEMY

Academy Study Break

Five Tips to Improve Advocating for Investment in the Lab

The lab relies on the lab manager to obtain approvals for investment in all the things the lab needs to conduct its science: people, space, instruments, and equipment. Developing strong advocacy skills is important for lab managers to deliver on this specific responsibility. Many people believe that the key to effective advocacy is face-to-face discussion with line management about the proposal. However, building the groundwork for that conversation is the foundation for strong advocacy. Delivering the support for the investment prior to the discussion frames the interaction with line management and can set up a positive discussion. Here are five steps to preparing for that conversation.

Focus on needs

Focus on the needs of the lab, not the wants. Needs solve problems, while wants solve inconveniences. In most organizations, funds for significant investments are tight, and only the most important proposals will get approval. Focus on the key things that are preventing the lab from delivering on its purpose and build solid, data-driven proposals to resolve those problems.

Effective business case

An effective business case comprises two different documents: a written document and a spreadsheet. The written document describes the problem to be solved, the best options to solve it, the highest value option, and the risks involved. This narrative is clear, concise, and factual. Line management can rarely have the emotional attachment to the science that the lab has, so this is a business document, not a treatise on the details of the solution.

The spreadsheet documents all the costs involved in the proposal and monetizes the benefits of the solution. It is written in terms of currency. Each of the technical benefits associated with the solution must be monetized to show a clear return on the investment (ROI). Together, these documents demonstrate the value to the organization of this proposal.

Concise pitch

Develop a concise pitch that delivers the key points from the business case, starting with why the investment is important and proceeding through how the problem can be solved and what steps are required to deliver it. The pitch should be framed as a business discussion that focuses on the problem, its solution, and the resulting ROI. The pitch needs to be flexible to be presented alone in a conversation or with data-driven slides in a presentation.

Listen

It is crucial to actively listen to the responses from line management about the proposal. To get approval, any concerns they have must be addressed. Line managers often have access to more information than lab managers, and proposals can be modified, adapted, and improved based on insights gained during the proposal meetings. Sometimes changes can be made on the fly during a conversation, and sometimes the proposal needs to be completely redone to take advantage of new information and circumstances.

Build trust

Consistently delivering on investments builds trust in line management that the data in the business case is accurate and actionable. Develop cases that are driven by data and are achievable; strive to under-promise and over-deliver. Stretching a business case to improve the probability of approval isn't worth it. Leaders' reputations are another key data point for line managers when considering different investment options. Once a proposal is approved, take direct action to deliver on the ROI.

Developing effective advocacy skills is important for the health and well-being of the lab. Labs are expensive facilities to operate and need highly trained staff, critical instruments, and equipment. Learning how to invest in the lab consistently is essential for its long-term success.

COLD STORAGE

WHY YOU SHOULDN'T OVERLOOK YOUR COLD STORAGE STRATEGY—AND WHAT LABS CAN DO TO GET IT RIGHT

by Kathi Shea

Cold storage sits in the background of the lab, quietly underpinning critical operations. It safeguards valuable samples, compounds, and clinical materials essential for scientific progress. Keeping these materials organized and accessible when and where needed is vital for continued lab efficiency. So, how can you ensure your cold storage setup continues to serve your lab effectively?

A cold storage strategy involves more than cleaning out a freezer; it means regularly assessing whether your current setup suits your lab's needs. That includes:

- where your samples are stored,
- how well they are organized and tracked, and
- whether current methods adequately support safety, efficacy, and sustainability.

Neglecting this kind of review leads to increased risk, inefficiencies, and unnecessary costs.

Without regular evaluation, cold storage often becomes cluttered and disorganized, causing operational inefficiencies. Researchers may waste time searching through freezers or re-making and re-ordering things they unknowingly already have. This increased risk of lost or misplaced samples adds unnecessary re-purchase costs and impacts research timelines.

Moreover, freezers can quickly become full of redundant samples or samples that don't require regular access. In one case, researchers found >50 percent of items in a lab's cold storage units were considered "unusable", with only 10 percent of materials accessed weekly.[1] As unit space runs out, labs may purchase additional freezers without evaluating their current storage situation, leading to significant space inefficiencies, alongside increased costs and energy usage associated with running unneeded freezers.

Beyond space, cost, and operational inefficiencies, poorly managed cold storage can pose reputational and safety risks. In labs without formal tracking systems, sample information is often held in individuals' heads. When those staff members move on, they take that knowledge with them, sometimes leaving behind unidentifiable materials that nobody feels comfortable using or discarding.

The consequences of this can be severe. For example, in 2014, six vials from the 1950s labeled "smallpox" were found in a NIH laboratory freezer.[2] A broader investigation uncovered more than 300 vials containing dangerous pathogens and compounds, highlighting the risks of neglecting cold storage.[3]

A well-considered cold storage strategy helps labs avoid these risks while unlocking measurable daily benefits. Better organization enables researchers to retrieve samples more quickly and efficiently, thereby improving lab efficiency.

Optimizing storage use also reclaims valuable lab space. Cold storage can occupy as much as 16 to 26 percent of total lab space; freeing up even part of this can allow for more productive uses, such as more bench areas.[1]

Despite the downsides of poor cold storage practices and the clear benefits of a refined strategy, labs often delay taking action due to time and resource constraints and the challenges of change management. However, improving cold storage doesn't always require a major overhaul—simple actions can make a meaningful difference.

Making cold storage optimization routine practice

While certain events (like relocating or undergoing a merger) often prompt cold storage review, labs shouldn't wait for these to act. Cold storage management works best

when embedded into everyday routines, and there are a few simple habits that can make a difference:

- **Schedule twice-yearly "spring cleaning" reviews**, using four key questions to assess material value: Is it identifiable? Does it have data associated? Am I allowed to use it? Is it still fit for purpose?
- **Build habits into routine lab activity** by taking some time daily or weekly to organize materials and update centralized logs
- **Tie inventory checks to freezer management**, e.g., once a month frost removal can be a good opportunity to take sample inventory and identify redundant materials; there are also sample management experts who can support this
- **Make sure you use adequate organizational tools** such as racking systems and barcode scanners to simplify tracking and retrieval

If you recognize that your current cold storage setup is no longer meeting your needs, it's time to consider a new approach. There are three primary models to choose from—in-lab, centralized on-site, and outsourced. The option, or combination of options, you choose depends on your needs.

Frequency of material access: How often you need to access your materials is generally the most important factor when deciding on the best cold storage method. As a general rule:

- **Daily access:** in-lab storage
- **Weekly or within three months:** centralized on-site or nearby at a facility that supports same-day delivery
- **Beyond three months:** outsourced storage with 24-72-hour retrieval windows

Lab footprint: If your lab is short on space, particularly in urban areas where lab space comes at a premium, outsourcing infrequently-accessed materials can free up floor space for more productive uses.

Internal resources and staffing: Labs may lack the internal resources, such as staff or reliable tracking systems, to manage their cold storage effectively. In this case, outsourcing may be appropriate for relevant samples as it provides access to dedicated staff specializing in sample handling, inventory management, and compliance. This reduces the workload for internal teams and helps safeguard samples.

ROI: The long-term expenses of running a cold storage unit can quickly add up. Understanding the complete financial picture of running an internal unit vs. outsourcing is essential for determining the best method for your circumstances. When considering cold storage total cost of ownership, assess:

- Space costs
- Electricity costs (units and HVAC systems)
- Liquid nitrogen consumption (if applicable)
- Maintenance costs
- Costs associated with sample tracking/cold chain
- Cost of security

Considerations for outsourcing

For labs exploring outsourced storage, choosing the right partner is essential.

Start by confirming the provider can return samples within 24 to 72 hours. Timely access is crucial, especially when materials are needed unexpectedly, but some providers may not be able to deliver your samples for a few weeks or even months.

Additionally, look for providers that offer more than just "freezer parking" or simply putting samples in freezers. While this may solve short-term space issues, sample retrieval can be inefficient, leading to delays, lost materials, and unnecessary labor costs. Instead, look for those that offer complete sample management services.

Shipping is another key consideration. Provider shipping systems should be validated for your type and quantity of material and follow chain-of-custody and compliance protocols.

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