Three top challenges facing the modern lab
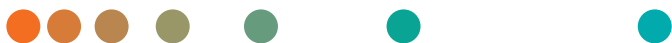
Guide

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Even though clinical laboratories account for 3% of the annual U.S. healthcare expenditure,[1] they serve a crucial function for effective healthcare delivery.

Laboratories are the highest volume producers in healthcare,[2] with about 14 billion laboratory tests performed in the U.S. each year[3] that impact two-thirds of all medical decisions.[4] Labs enable clinicians to make accurate and timely diagnoses, driving better patient and population health outcomes. They also contribute to patient satisfaction.

But today's labs face major challenges that reduce their efficiency, timeliness, performance, and cost-effectiveness. In this Guide, we'll examine the top three challenges facing modern labs today—**turnaround time, clinical and operational standardization, and staff shortages**—and offer strategies you can use to make improvements in your lab.

1

Turnaround time

Clinicians consider timeliness to be just as fundamental as accuracy when it comes to test results. The sooner results are in, the sooner a diagnosis can be made and treatment can begin. Delays in test results account for 80% of complaints made to labs.[5] The speed from testing to diagnosis and treatment impacts the patient experience as well. Delays can be stressful to patients and lower their levels of satisfaction.

Improving TAT helps labs gain significant clinical, operational, and financial benefits:

Clinical benefits

Improving TAT in the lab leads to:

• Faster time to test results
  and diagnosis
• More timely medical interventions—
  both diagnostic and treatment
• Improved patient management,
  such as shorter length of stay
  in the ED or OR, for more
  efficient healthcare delivery
• Better population health
  management
• Speedier testing which drives faster
  throughput and increased capacity
• Greater clinician confidence
  and satisfaction
• Less stressful and more satisfying
  experience for patients
• Better clinical outcomes for patients

Operational benefits

Improving TAT in the lab directly impacts
key operational issues, including:

• Reduced waste and fewer errors,
  saving time, space, and costs
• More efficient workflows that
  streamline the testing process and
  produce quicker, quality results
• More automated processes that
  eliminate manual processes,
  saving time and staff effort
• Fewer equipment failures and
  faster time to overcome the failures
  that do happen
• Greater ability to deliver and
  report on regulatory compliance
• More sustainable operations
• Better inventory management
  and logistics
• Optimized space that accommodates
  changes and enhances performance
• More engaged and satisfied
  employees, which improves staff
  recruitment and retention
• More effective storage space
• Better trained staff that perform at
  their highest levels of expertise as
  well as cross-functionally

Financial benefits

Improving TAT in the lab reduces
healthcare expenditures and improves
profitability, by:

• Shortening patient lengths of stay,
  particularly in ED and ICU
• Increasing daily revenues and the
  monthly revenue cycle in the lab as a
  result of higher throughput
• Greater reimbursements from
  increased volume and capacity
• Lower incidence of test duplication

You can use a number of strategies to speed up turnaround time in your labs.

Incorporating efficient automation

Using the right technologies and eliminating manual steps can help reduce the workload for technicians, prevent errors, speed up process times, and streamline documentation. New automated equipment is now capable of doing everything from labeling, sample sorting, centrifugation, and decapping to automatic analysis, result entry, report verification, and delivery. Middleware systems interface between the laboratory information system (LIS) and laboratory equipment and offer dashboards and reports that are ideal for monitoring and improving TAT and quality control. They also provide auto-verification of test results using computer-based rules. Plus, the rise of new artificial intelligence (AI) automation in labs is expected to optimize workflow, testing sequence, result interpretation, and result augmentation.

Refining staff workflows, workloads, and training

Staff shortages in the lab are a sad reality that is unlikely to go away anytime soon. To retain accomplished technicians, it is crucial to manage workloads, keep staff working efficiently, and alleviate stress in the lab. The more automation there is, the more likely key functions can be supported effectively without overtaxing staff. A constant process of evaluation, input, and testing can help streamline work processes and make work less stressful for your technicians. Staff training is another essential tool to help lab technicians operate more efficiently and effectively and needs to be an ongoing component of lab management. Ultimately, a disciplinary examination of staff workflow and workload lead to improved TAT.

Applying Lean and Six Sigma methodologies

Lean and Six Sigma methodologies have been effective in improving turnaround times in clinical laboratories by eliminating waste, reducing errors, standardizing processes, and promoting continuous improvement. Lean is a systematic approach to removing waste or any steps that don't contribute value to the end result. Six Sigma is a method for improving processes and eliminating defects in a system. Using these methodologies, labs can discover areas where workflow can be streamlined, driving better test results and turnaround times.

Reconfiguring lab space design

The way your lab space is designed can significantly impact lab efficiency (regardless of its size) as well as TAT. Understanding how work flows through the lab in detail can help determine the best organization of instrumentation, equipment, and supplies. With staff input, you can identify slow points and find alternative ways to conduct testing more efficiently, including reorganizing equipment adjacencies. Additionally, planning lab space for adaptability can accommodate equipment and manpower changes over time.

Conducting continuous quality improvement

Regulatory bodies and accrediting organizations recommend that clinical labs focus on TAT as part of their continuous quality improvement expressly because slower TAT results in delays to diagnosis. By regularly examining systems and procedures, workflow and space organization, staffing competencies and gaps, automation versus manual processes, as well as the time it takes for a lab test to go from ordering to result delivery, your lab can continue making steady improvements that reduce lab TAT.

2

Clinical and operational standardization

Today's labs face daunting challenges, ranging from regulatory compliance and staffing shortages to increasing test volumes and effective integration of advanced technologies, all while delivering the highest quality test results–outcomes clinicians can rely on for accurate diagnoses and treatments. But labs are also part of a greater institution and must contribute to their system's performance in a value-based healthcare environment.

Adopting standardization principles leads to meaningful clinical, operational, financial, and population health management improvements. Clinical standardization ensures that test measurements are accurate and reliable, and, most importantly, that the same analytical precision is achieved across all labs, measurement systems, and time.

Operational standardization of reagents, assays, and consumables offers several benefits to the modern lab. It streamlines access to materials and provides alignment with instrumentation while making procurement and inventory management more predictable. In addition, labs equipped with automation and sophisticated digital solutions can streamline routine maintenance, quality control processes, sample handling, and complex data analysis.

Standardization offers significant benefits that impact clinical, operational, financial, and population health management dimensions within and beyond the lab:

Improving testing quality and accuracy

enabling labs and clinicians to feel confident that they are delivering more reliable diagnoses, supporting treatment decisions, and improving patient outcomes.

Increasing efficiencies and cost savings

by streamlining processes, reducing inefficient and unnecessary variations, and optimizing resource allocation, which results in better resource utilization, patient outcomes, and cost savings.

Enhancing patient safety

by identifying and mitigating the potential hazards and risks associated with laboratory testing, which measurably reduces the incidence of adverse events and contributes to improving overall patient care.

Advancing research and innovation

by supporting benchmarking, quality improvement initiatives, and clinical trials. Over time, this leads to the development of new diagnostic tests, treatment protocols, clinical pathways, and healthcare technologies, which improve patient care and population health.

Enabling greater data exchange and interoperability

so that labs can more efficiently share test results, integrate with electronic health records (EHRs), and exchange other health information in real time, which promotes coordinated care, continuity of care, and population health management.

Supporting population health management

by aggregating and analyzing data at a population level to identify trends, patterns, and health outcomes. This allows healthcare providers to proactively discover and address health issues within populations and implement targeted interventions, driving better patient care and population health outcomes.

There are four primary standardization strategies for improving lab quality, efficiency, reliability, and costs.

Standardizing test menus
Choosing which tests to include in your test menus can be stressful for lab managers. While new tests are being approved that offer valuable diagnostic insights, not all tests deliver sufficient clinical relevance or serve a wide enough population to make sense as part of your lab's test menu. Additionally, the needs of different labs within your system (e.g., inpatient, outpatient, ED) impact which tests to offer at each location. To make informed choices, lab managers need to take a disciplined approach and work with clinicians to assess each test for the value it delivers to patient populations. By focusing on test relevance, you'll be able to identify the tests that drive quality outcomes and health improvements.

Standardizing technology platforms and instrumentation
Technology requirements in the lab are inherently complex because of the wide range of tests that need to be conducted. But clinical efficiencies can be achieved by standardizing technology platforms and instrumentation for each capability and across all lab locations. Automation with advanced sample management systems can greatly contribute to standardization by improving sample tracking, reducing errors, and enhancing data management. An upgraded LIS can automate data entry, result reporting, and data analysis, reducing variability and improving data accuracy and traceability. These automation technologies also facilitate standardization of workflows, protocols, and documentation, leading to more consistent practices, reliable outcomes, operational efficiency and patient safety.

Standardizing protocols and procedures
Clinical standardization of protocols and procedures enables laboratory staff to test and refine workflows and develop best practices for all testing phases, including pre-analytical, analytic, and post-analytical. This streamlines daily operations, increases efficiencies, reduces turnaround times, and improves regulatory compliance and safety. Clinically standardized protocols and procedures make staff training more essential than ever, while encouraging higher levels of staff engagement as technicians communicate and collaborate on shared problem-solving. Ultimately, these protocols and procedures drive greater efficiency and consistency, and improve test results throughout your laboratory network.

Standardizing reagents, assays, and consumables
Operational standardization of reagents, assays, and consumables can significantly impact laboratory costs and performance as well as promote uniformity in patient care. By standardizing technologies and equipment, the use of reagents, assays, and consumables becomes more predictable and allows for consolidation of testing volume. As a result, labs simplify procurement and inventory management, reduce testing variability, and improve supply chain logistics and costs. Operational efficiencies are also gained by streamlining staff training, equipment maintenance, and troubleshooting processes at the same time that they minimize waste and errors. Additionally, through consistent and standardized laboratory practices, laboratories support system-wide, data-driven population health management strategies, interventions, and outcomes monitoring.

3

Staff shortages

Lab staffing shortages have been apparent for years and have reached a critical point. The industry estimates a shortage of 20,000 to 25,000 laboratory technologists nationally, which translates into one technologist for every 1,000 U.S. citizens, a shortfall of 7%.[6] The Bureau of Labor Statistics projects a 13% increase on average for trained lab technologists and technicians between 2016 and 2026.[7] The COVID-19 pandemic made matters worse. In addition to the estimated 14 billion lab tests performed annually in the U.S., an additional 997 million diagnostic tests were added for COVID.[8]

Despite staffing shortages, testing must be conducted accurately and promptly to deliver the quality that healthcare providers, clinicians, and patients expect. Fortunately, there are many strategies that can counter the pressures caused by staff shortages, including some of the same strategies that assist in reducing turnaround times.

Increasing lab automation

Effective integration of automation eliminates manual processes, making workflow and workload more manageable for staff. Upgrading your LIS is one important way to achieve this. A comprehensive LIS uses rules to replace manual processes, maximizing interoperability with instruments, third-party services, and EHRs. This results in reduced data entry errors, easier specimen tracking, and allows lab professionals to focus on tasks that utilize their expertise. In addition to upgrading your LIS, there are other ways automation can enhance your operations. Even the smallest solutions, like decapping systems or automated cleaning and reprocessing of equipment, can significantly reduce the time staff spend on repetitive tasks.

The benefits of automating lab processes can be profound:

- Decreased turnaround time
- Increased availability of the highest-certified staff to review critical samples and conduct complex tasks
- Increased productivity
- Improved quality through reduced manual errors and automated quality control (QC)
- Increased flexibility and scalability
- Reduced safety and biohazard risks by lowering or eliminating sample handling by staff

Making workflow improvements

Re-engineering the workplace is fundamental to maximize lab professionals' ability to perform at their highest levels. This includes using Lean and Six Sigma methodologies, conducting a staff-to-workload analysis, making specific assessments of discrete stages in the workflow process that may lead to other solutions, and involving staff in workflow analysis and refinement.

Offering competitive terms of employment

Attracting and retaining satisfied employees is crucial to the success of any organization. While salary is important, it's not the only factor that affects employee satisfaction. Here are some suggestions:

- **Work with your HR recruiting staff to evaluate current average salaries** in your area for each position in the lab. Then work with them to determine the best and most competitive salary you can offer.
- **Promote the full benefits package your institution offers** and identify and convey the most unique and/or important benefits that appeal to candidates.
- **Offer expanded options for continuing education** both in your institution and via certification or matriculation. Consider both the time you make available for continuing education as well as cost reimbursement.

- **Adapt work schedules to staff** whenever possible, such as offering individual flexibility for a mother to take a child to the doctor during a regular shift.
- **Use career paths, mentorship, and an emphasis on internal hires to develop staff over time**. Research shows that labs that communicate developed and clear career paths and fund external continuing education had a significantly lower three-year average turnover rate than those that did not.[9]

Streamlining space design

You can apply some proven space design techniques to enhance the physical environment and make the space more productive and appealing, including:

- **Using natural light and bringing the outdoors in** to make it easier for lab professionals to see what they are doing, reduce eye strain and headaches, and contribute to regulation of circadian rhythms, which in turn improves health and productivity.
- **Applying workflow-centric lab design** to examine and streamline adjacencies and space layout. Consider sequence, headcount, space constraints, equipment utilization, collaboration, and safety when designing your lab space.

- **Focusing on ergonomics** Poor posture, repetitive motions, and fatigue result from space that isn't designed around how lab professionals do their work. Determine the right height for equipment and use adjustable chairs, benches, sit-to-stand desks, and other ergonomic techniques to optimize the physical status of staff while they are working.
- **Building in proximity** Labs benefit when staff work collaboratively. Make sure your space is designed for proximity so that informal and formal communication and collaboration is encouraged.

Communicating openly and frequently

Staff want to be heard and appreciated. This is particularly important in high-stress environments. Make sure you are using open communications techniques to increase staff engagement, productivity, and satisfaction, such as:

- **Listen actively**
  Walk around and engage with lab staff on a regular basis. Take the time to listen to their concerns and suggestions, and provide feedback on their ideas. Conduct routine pulse checks to better understand their challenges and expectations for their work. Use open-ended questions to encourage them to share their views and experiences. Hold regular one-on-one sessions with employees to review performance and career development.
- **Communicate transparently**
  Keep staff informed about challenges that impact their work. Ask for their feedback and suggestions and act on it whenever possible. Be transparent about operational, management, and performance issues in a timely manner. Recognize and celebrate staff contributions and accomplishments. Use various communication channels, from email to team meetings, to ensure everyone is in the loop.
- **Engage collaboratively**
  Encourage staff to participate in identifying bottlenecks and solutions to workflow problems. Ask for input about space design, ergonomics, equipment performance, and stressors. Involve them in process and equipment decision making. Enable more experienced staff to mentor newer recruits, and provide opportunities for professional development and career growth. Foster a positive team culture where all staff feel valued and supported.

Providing recognition

Recognition is highly prized among employees. Honest praise and feedback recognize how hard staff work in a stressful environment and make them feel appreciated and seen. For some people, rewards are motivational and can get reinvigorate individual performance. You can also foster teamwork by recognizing achievements among all your lab team members.

There are many forms of recognition that can drive greater levels of engagement and satisfaction from lab professionals:

- One-on-one recognition by a manager for consistent performance or problem solving.
- Private positive feedback from a coworker, ordering clinician, or institutional leader.
- Public acknowledgement in the form of awards or certificates and celebrations. Look for opportunities to highlight lab staff achievements in newsletters, social media, and other communications that reach beyond the lab.
- Increased responsibility for more meaningful work.
- Perks, such as gym memberships and free coffee, which make lab professionals feel better about their workplace.

Emphasizing staff training and development

From their entry-level jobs through years of working in the lab, your staff want to continue experiencing intellectual, scientific, and professional growth. They also want to increase their proficiency with their job skills, daily work, technologies, and equipment. In other words, despite the daily workload stresses, your lab professionals want to advance. The more you address this desire, the more likely you'll be able to retain effective employees and foster a high-performing lab team.

Addressing burnout

There's no getting around the stresses staff face in labs today. A recent survey published in the American Journal of Clinical Pathology showed that 53.4% of surveyed lab professionals reported feeling a lot of stress, 85.3% reported struggling with burnout at some point in their careers, and about 50% reported they were currently dealing with burnout.[10] Survey respondents indicated that as a result of burnout, they had considered changing careers, employers, professions, or retiring.

To address burnout, it is essential to focus on communications. Here are some mitigating solutions:

- Clearly define and discuss expectations with staff so that they have guidelines to follow and understand what is expected of them.
- Encourage employees to tell you when they feel stressed or burned out and work with them to develop individualized solutions.
- Create daily workflows that include regular breaks for all staff.

- Introduce staff to work-life balance programs within your institution or community to help them integrate strategies that relieve stress.
- Organize team-building events that draw the entire lab team together.
- Host social events that support both a team outlook and individual recognition.

Most importantly, create a safe and engaging work environment that allows staff to express their concerns and know they will be listened to. Just knowing that their perspectives matter goes a long way to making staff feel their work is encouraged and supported.
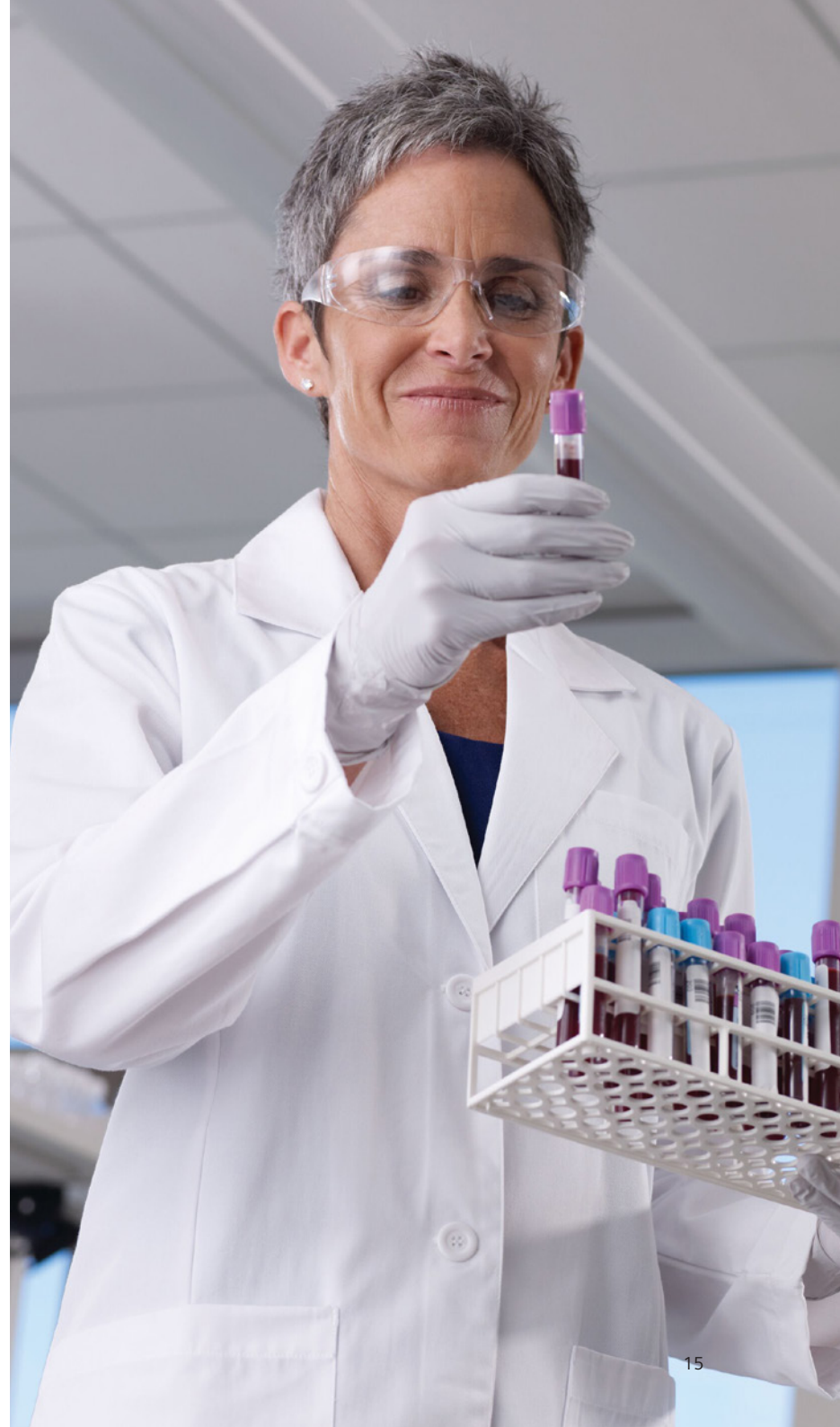
Keep challenges from detracting from your Lab's performance

The top 3 challenges facing today's modern lab can be daunting, but there are strategies you can implement now to significantly improve your lab's performance. Tackle turnaround times, clinical and operational standardization, and staff shortages with strategies that are specifically designed to ensure your outcomes are high quality, timely, efficient, consistent, reliable, and satisfying for you, your staff, your clinicians, your institution's leadership and patients.

More information

For deeper insight into each of these lab challenges, please access our eBooks:

Building Trust with Clinicians: Strategies for Improving Your Lab's Turnaround Time

Clinical and Operational Standardization: Driving Improvements in Today's Lab

The Lab Staffing Crisis: Strategies for Overcoming the Biggest Challenge Facing Labs Today

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