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CentraBytes

Using metrics to assess and improve laboratory performance

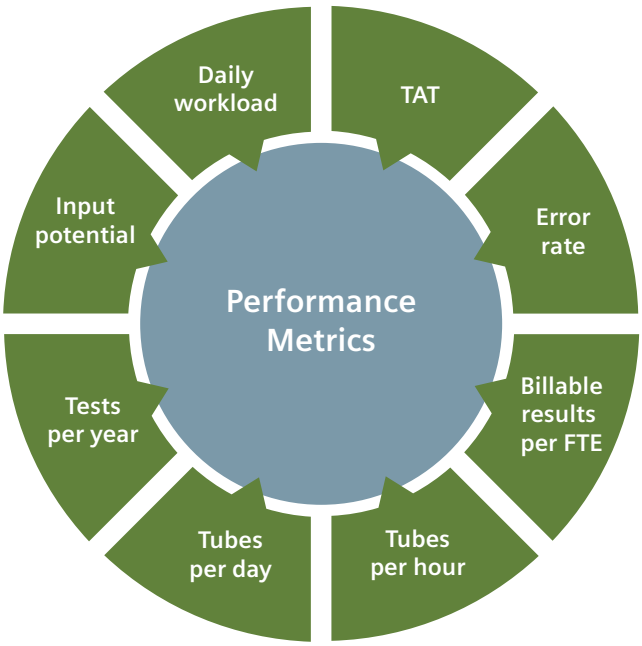
Introduction

Laboratories today are well aware of the push to shorten turnaround time (TAT), increase patient safety by reducing errors, and lower costs through efficient use of technologist time, reagents, and other resources. Key indicators such as percentage of results reported within targeted TAT, error rate, and billable results per full-time equivalent (FTE) have become standard measures of performance. There are many other invaluable metrics that can be used on a daily basis to identify issues and fine-tune processes to drive performance. Used effectively, metrics provide day-to-day feedback, alerting laboratories to areas that need attention, and ultimately lead to the outcome that every laboratory wants—quantifiable and favorable performance indicators that can be shared by laboratory staff and the executive team to make observations and guide decisions in the laboratory.

Answers for life.

Ensuring quality

Your analysis starts where the workflow begins—with incoming specimens; troubleshooting and workflow adjustments begin here. Inadequate specimens (e.g., insufficient amount, hemolysis) and incomplete or incorrect labels can cause delays and inaccurate results, and often require costly and unnecessary repeats. Some laboratories rely on incident reports generated by the LIS to flag specimen issues, including lost or destroyed specimens. Others monitor the number of specimens in the Priority Output lane, a feature on Aptio™ Automation that identifies the specimens that require action (e.g., unreadable barcoding, no test order, incorrect sample type) to spot trends that may point to training needs. Problematic patient specimens are also flagged, post-analysis, using delta checks and patient moving averages, both used routinely by many laboratories.



Error rate is an unequivocal indicator of quality. College of American Pathologists (CAP) surveys are well accepted for proficiency testing, and many laboratories use the results as a measure of quality of results. A more direct measure is the number of erroneous results flagged by clinicians after they have been reported. By tracking error rates over time, laboratories can identify favorable and unfavorable trends and positively reinforce good practices in the laboratory or correct underlying problems.

Beyond looking at error rates, some laboratory managers believe it is more important to look at each incident and understand why it happens. Incident reports are filled out daily and entered into a hospital risk management system. Additionally, a quarterly report at the laboratory level is helpful in looking at trends. The most significant error is a result reporting error, when a substantive change of a test result in a patient's medical record is required and there is a potential patient care impact.

Shortening turnaround time (TAT)

Delivering accurate results to the clinician as quickly as possible is the goal of every laboratory. TAT is influenced by many factors, including, first and foremost, overall efficiency in moving the incoming specimen through the laboratory workflow until the final result is reportable. Variables that may prevent unnecessary reruns—such as sample integrity, well-established ranges (review, rerun, reflex etc.) or method linearity, have some degree of influence on TAT. Equipment downtime can severely slow reporting of results, and thus service contracts and support infrastructure such as online remote troubleshooting are critical.

Most laboratories classify tests into two categories when assessing TAT—routine and STAT, which is often associated with emergency rooms. For routine TAT data, time from "received in-laboratory" to "result verification" is used most often. For the emergency department (ED), some laboratories provide monthly statistics for "collect" to "verify" and "in-laboratory" to "verification" for certain tests that are monitored for the ED's special certifications, such as stroke and cardiac. Some TAT is reviewed daily, some monthly, and some as needed.

For example, challenges in meeting TAT goals have resulted in increased adoption of autoverification of test results to help speed up the process. Although the time needed to determine the criteria and set up the program to start autoverifying results can be daunting, every laboratory that has completed the process benefits from the time savings gained. These percentages vary depending on many factors. For example, a laboratory that largely serves an outpatient population may readily achieve a high percentage of autoverification since most patient specimens will fall within the "normal" ranges.

Most laboratories go through a learning curve in adopting autoverification. Since the needs and preferences of each laboratory are unique, so are its criteria for autoverification. The ability to customize review ranges, quality control tracking, delta changes, and instrument flags to meet these needs are invaluable for a smooth and effective implementation.

Assessing productivity

Billable results per FTE is a classic measurement of labor efficiency. Others, such as increases or decreases in tubes processed, and results reported per unit time, are indicators of workload and, combined with FTE, provide insight into laboratory efficiency. For example, laboratories experience improved productivity by being able to handle increases in workload, while keeping the number of FTEs the same or fewer. A related metric is capacity—how many specimens or results can be handled without adding instrumentation—utilization, or the percentage of capacity used by current workload.

Lab professionals know that productivity, quality, and TAT are often interrelated. Automation track and system downtime can slow testing and reporting, divert skilled technologists' attention to troubleshooting and workarounds, and away from their primary responsibilities. The increasing use of quality control (QC) data such as patient moving averages not only improves the accuracy of results through early warning of quality issues, but has the added benefit of optimizing laboratory performance. By diverting specimens from the analyzer that triggered a QC alert, such as a Westgard rule violation, to another that is performing within range, TAT benefits from uninterrupted workflow and efficiency is improved by not wasting reagent on an unnecessary test.

Taking action to optimize performance

1. Identify the underlying metrics that can help day-to-day operations. To improve TAT for a specific assay, for example, identify opportunities within the laboratory workflow for improvements. This may come in the form of correcting errors in specimen collection or taking a close look at autoverification parameters.
2. Look for sources of unexpected errors. Delta checks and patient moving averages are powerful ways to pinpoint errors in patient specimens or discrepancies in results from different instruments.
3. Invest in learning and deploying laboratory IT. As with all tools, it takes time to understand the value of software features and put them into action. This means, for example, mobilizing the team to define parameters, get support setting them up, and learning to use them. When deployed, many of the tools in CentraLink™ Data Management System can save valuable technologist time, improve TAT, and reduce errors.

Metrics are a powerful tool for assessing how well a laboratory is performing in meeting TAT goals, achieving patient safety, and maximizing efficiency. Day-to-day, it is an opportunity to get the needed feedback to improve performance.

Acknowledgement

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