Hematology standardization for the IDN

By Nilam Patel and Anne Tate

Hospitals, allied healthcare facilities (e.g., outpatient clinics and nursing homes), and other ancillary services (e.g., core laboratories) that make up an integrated delivery network, or IDN, satisfy all of their patients’ healthcare needs through a single governing source that promotes patient-care quality and enables shared expertise, technology, and information.

Not unlike their stand-alone hospital counterparts, costs and labor pressures continue to weigh heavily on IDN laboratory managers who seek creative ways to minimize “test-tube touchpoints” while maximizing the number of tests and information available from each tube across the board. These challenges can best be met through a laboratory strategy that focuses on standardization of sample and data management.

Standardization is achieved through the use of products applying similar technology, while offering different levels of sample throughput. Labs, especially those in large integrated health networks, are looking for standardization and scalability companywide. IDNs require instruments that produce the same quality results (using the same reagents, the same software-management system) and have the ability to scale up and down, depending on the test volume at the individual lab location. Applied rules must be the same 24/7 and across all instrumentation. Samples need to be handled the same way, regardless of shift or day of the week. The IDN medical technologists review a variety of data to validate results: instrument flags, demographic data, and comparison with previous result — without subjective results variations. The time-consuming validation process of manual, paper-based result comparison and unnecessary rerun testing needs to be eliminated. An instrument solution should automate pre- and post-analytical sample and data management throughout the organization. A system that can handle virtually all lavender-top tubes in an automated fashion while utilizing rules-based (decision logic) software, meets these needs.

The handling of the lavender-top tubes used in areas such as hematology and diabetes testing, slide making and staining, sorting and archiving, repeat testing and decision processes can be combined into a single automation platform. By doing this, laboratories within the integrated network can realize hands-free lavender-top management to conduct analysis of 90% of tests compatible with EDTA samples (i.e., reticulocyte, differential, complete blood count, hemoglobin A1C) with as minimal human intervention as possible. A system like this can handle the largest of volumes, even from multisite locations, consolidating and communicating data from multiple hematology analyzers to laboratory information systems (LISs) — improving quality control, optimizing workflow, and positioning for future laboratory growth.

A library of system rules drives sample operations and improves efficiencies in laboratory operations. Rules can be simple or complex based on the laboratory’s best practices and unique workflow. For instance, rules can be written to include non-numeric as well as patient demographics data, in the absence of a test order to drive the automatic addition of another test. The rules engine ensures that the correct test is consistently added, based upon the patient location and age. The rules engine should also be able to evaluate whether a smear needs to be prepared on the “presence” of an instrument flag and/or a combination of demographic indicators and whether a slide was “not” made previously within a laboratory’s defined time frame. These types of multivariable rules can be used to autovalidate 70% to 80% of hematology results, releasing them to the LIS without operator intervention or further LIS actions. Technologists can then focus on the remaining 20% to 30% of variant results that require additional decision-making. Labs can achieve dramatic results when combining many variables to build their rules. These rules can be very specific and may be adapted as the laboratory changes.

In conjunction with standardization of instruments, IDNs also need to standardize review and management of quality-control (QC) practices and results. Middleware-managed quality-control software, using system-wide rules that consistently evaluate QC across all labs, shifts, and technologists, meets these needs. Standardized QC qualification enables the IDN to measure instrument precision across the same lot numbers and across all sites by instrument type. This information can provide the ability to quickly identify QC trends (proactively versus retrospectively) to minimize risk to patient reporting. An enterprise view of QC, both graphically and statistically in real time, provides one more tool to help improve medical outcomes.

By standardizing instrument platforms, information integration, and advanced technologies, integrated health networks can achieve unexpected levels of optimization for laboratory operations that literally transform their productivity. For example, traditional manual specimen retrieval can take between three and eight minutes per tube just to locate a specimen and resubmit it for additional analysis. Automating the reflex and rerun testing significantly reduces the handling of hematology specimens to eliminate this retrieval time. The tedious, time-consuming step of specimen retrieval for repeats and reflexes is eliminated. This translates into measurable improvement in result turnaround time as well as reducing valuable technologist time.

A typical automated laboratory can also expect to reduce other manual steps involved with repeat reflex testing and sample searching. Samples are tested, additional testing is ordered automatically, and slide making and staining is performed, without operator intervention. The combination of innovative instrument hematology technology, automation, and decision-logic rules, offers personnel within integrated health networks’ multisite, multisized labs the benefit of standardized care and drives consistency in their efforts.

Nilam Patel, senior product manager, Laboratory Automation Solutions, oversees Sysmex America’s laboratory-automation product line and Lavender Top Management initiatives, while Anne Tate, senior product manager, IT Products, manages its IT solutions, in conjunction with Sysmex instrumentation and devices.