# Improve testing turnaround by looking beyond the lab

**By Jan Weaver**

When Jay Jones stepped out of the central lab and started asking questions about blood-gas testing turnaround time (TAT), he discovered a 12-minute gap.

"We thought we had excellent turnaround time, averaging about three minutes," says Jones, director of chemistry and regional labs in the Department of Laboratory Medicine at Geisinger Health System, Danville, PA.

In the spirit of continuous improvement, he began to investigate further. "It was a matter of getting out of the lab, walking around, and asking questions. Physicians were reporting turnaround time at about 15 minutes!"

The investigation marked the beginning of a "friendly collaboration" between Geisinger's lab and clinical departments. Jones initiated a study that examined the testing process "vein to brain;" that is, from the time the test is ordered to when the result is reported back to the clinician.

"It was only after we talked to the docs that we asked ourselves where delays were occurring," says Jones.

Focusing first on the cardiovascular operating room (CVOR), Jones worked with all the stakeholders — the STAT lab, perfusionists, IT, physicians — to map the current process at Geisinger Medical Center, a 403-bed hospital in Danville. Mapping the workflow revealed that major testing bottlenecks were occurring in the pre- and post-analytical phases.

Even before the specimen crossed the threshold of the central lab, nine separate steps averaging a total of almost eight minutes were involved in ordering the test and collecting the specimen. These included the mundane and time-consuming manual tasks of preparing a paper requisition, labeling the syringe, and packaging the specimen for transport in the pneumatic tube. In the lab, specimen receipt, testing, and reporting (phoning the result to the CVOR staff) averaged 2.4 minutes. Mean sample transit time via pneumatic tube was about four minutes. Altogether, 36 testing transactions were timed on two shifts over two weeks in both the CVOR and the central lab.

Jones has since implemented several process improvements in a "functional prototype" that is evolving as stakeholders provide input.

"We wanted to improve so that we could remain centralized," noted Jones. Likewise, the physicians and nurses in the clinical departments "have 20 other things demanding their attention" and would prefer not having the additional responsibility of running blood gases, he says.

Information technology and automation are playing a key role in the solution being evaluated. For Jones, IT is the enabling component, allowing the lab to maintain control of testing while delivering fast turnaround at the point of care.

Geisinger's central lab uses analyzers that feature an automatic sample-handling module designed to work with the manufacturer's syringe. The syringe is pre-bar-coded and incorporates an integrated mixing ball. When placed on the analyzer, the sample is identified by the analyzer's integrated bar-code scanner, then automatically mixed and aspirated. Both the analyzers and syringe are being used in the Jones' model.

In the model, several pre- and post-analytical steps are eliminated through the use of middleware that links the analyzer in the lab to the CVOR's "databahn," computer terminals integrated with the perfusion pump that capture all patient events and transactions during a procedure. The middleware link, running within the analyzer manufacturer's client-server hardware, automates transmission of the result report from the lab to the CVOR, eliminating several manual transactions in the process.

Use of the pre-bar-coded syringe facilitates sample registration as well as sample and patient ID match. In the future, when an instrument-generated order, or IGO, interface is implemented, paperless ordering will be possible.

"The greatest challenge has been getting all the stakeholders to contribute to the prototype," comments Jones. "We have to do this in an environment that is highly regulated, so we have to practice 'safe computing'. We need to get sign-offs and make sure IT endorses [the client-server configuration] and network connections."

Longer term, Jones sees the solution being implemented across the Geisinger enterprise at Geisinger Medical Center, the Geisinger Wyoming Valley and perhaps even the Geisinger South Wilkes-Barre facilities.

"Once we have established wireless connectivity in our prototype, we will want to bring it to other departments and other hospitals in the Geisinger system," says Jones.

Jones anticipates an improvement in total TAT of 30% to 60% if all recommend improvements are implemented. Even so, the job of process optimization requires continuous vigilance, which means the implementation will continue to evolve. □

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