TriCore Lab Adds Value With Consults, Better TAT

Pathologists and Ph.D.s get out of laboratory and do rounds with doctors at client hospitals

CEO SUMMARY: Motivated by the goal of delivering more value to clinicians and client hospitals, the lab team at TriCore Reference Laboratories in Albuquerque, New Mexico, is proactively introducing new services. One such initiative is to travel to hospitals to participate in rounds and consult with physicians regularly. Another initiative improved the accuracy of* C. diff. *diagnosis while dramatically reducing lab test turnaround time. These changes help client hospitals improve patient outcomes.

As healthcare moves swiftly toward outcomes-based reimbursement, innovative labs are responding with new ways to deliver more value to referring physicians.

In Albuquerque, New Mexico, one lab organization is pursuing a dual strategy designed to support physicians in achieving improved patient outcomes while contributing to a reduction in the cost-per-diagnosis and the overall cost-per-episode of care.

At **TriCore Reference Laboratories**, one half of this strategy is devoted to getting pathologists and Ph.D.s out of the laboratory so they can consult directly with physicians in patient care settings.

The second half of the strategy is to harness specific diagnostic technologies in tandem with enhanced lab informatics capabilities to deliver more accurate lab test results in a shorter period of time. The goal is to help doctors and nurses more consistently access lab test results as they are reported and then act in a timely fashion to deliver the most appropriate care to their patients.

It is widely recognized by the pathology profession that clinicians get much more value from lab testing services when pathologists, Ph.D.s, and lab scientists are physically present and available to provide consultations.

This is why TriCore's scientific team has begun making the rounds with clinicians in Albuquerque hospitals and they meet with treating physicians one day a week at the hospital and at TriCore's central laboratory. This effort is led by Michael J. Crossey, M.D., Ph.D., TriCore's Executive Medical Director and interim CEO, and Karissa Culbreath Ph.D., D(ABMM), a Scientific Director of Infectious Disease at TriCore.

More Effective Alerts

In support of this direct interaction, TriCore has built alerts into its laboratory information system (LIS). This allows its client services department to call significant lab test results to treating physicians and nurses on hospital floors at its client hospitals.

"Implementing these new added-value laboratory services requires adoption of a different culture within the lab," noted

Crossey. "As this happens, laboratorians can become actively engaged with treating physicians and floor nurses in order to make recommendations to improve patient care."

In fact, TriCore's lab team is learning that the combination of these lab test alerts and providing active consultation outside the laboratory produces impressive results, including better patient care at lower cost. These new lab services directly contributed to improvements in how physicians utilize lab tests. As well, there are improvements in how physicians receive lab test results and act upon them in ways that contribute to better patient outcomes.

Added Value Strategy

That is where the second part of TriCore's added value strategy comes into play. "Sometimes lab directors can take many steps to improve lab test sensitivity and even turnaround time (TAT)," observed Culbreath. "But if the treating physicians are unable to view or act on these results fairly quickly, these improvements will not advance patient care or cut costs for hospitalized patients."

To address this problem and convert it into an opportunity, TriCore revamped the way it communicated alerts to clinicians. One major success in this effort came from how the laboratory changed the way it handled testing for *Clostridium difficile* (*C. diff*) infections.

"In order to deliver more value to clinicians, we wanted to achieve three goals," stated Crossey. "First, we wanted to adopt a test methodology which would improve the sensitivity and specificity. That would provide clinicians with a more accurate test result.

"Our second goal was to reduce turnaround time," he continued. "This is particularly important to hospitals because of the emphasis on reducing hospital-acquired infections (HAIs).

"Third, as noted above, it is important that clinicians pay attention to critical results and act upon them in a timely way," commented Crossey. "That is why we established different protocols for alerts associated with *C. diff* testing."

The changes in how alerts for *C. diff* test results are communicated to clinicians at client hospitals have increased the value of new testing methodologies implemented at TriCore. "For positive *C. diff* test results, our lab's call center staff telephones the floor nurse, referring physicians, and hospital epidemiology soon after the results become available," said Culbreath.

Collaborative Relationship

"Alerting the floor nurse and referring physicians is unusual for many labs and that is particularly true for a reference lab," she noted. "But TriCore does this to further its collaborative relationship with its hospital clients."

To achieve the goals of improved accuracy, faster turnaround times, and reduced cost-per-diagnosis, TriCore changed the way it tested for *C. diff*. That took place in May 2011. How and why TriCore revised the way it tests for *C. diff* offers important lessons about how a laboratory's pathologists and Ph.D.s can become more involved in consulting with referring physicians.

"Two years ago, we used a batched ELISA-based assay that we ran for *C. diff* once or twice a day," explained Culbreath. "However, as most hospital lab professionals know, this left several opportunities for improvement unaddressed.

"First, because *C. diff* results were available only once or twice daily, this delayed the diagnosis," she commented. "Second, without a diagnosis, the hospital staff did not know whether to continue to quarantine the patient and implement additional downstream infection control requirements. For both reasons, a more accurate answer delivered more quickly was expected to be a big winner in the diagnosis and treatment of *C. diff*.

"We considered the different alternatives," added Culbreath. "This included using polymerase chain reaction (PCR) test-

ing for all patients suspected of having *C. diff*. Numerous PCR platforms can provide a rapid diagnosis, but PCR is more costly than the enzyme immunoassay (EIA) we were using at that time. So we developed a testing algorithm that uses PCR testing only when absolutely necessary for a diagnosis.

Batch Tests Eliminated

"This produced a dramatic reduction in turnaround time for *C. diff*," observed Culbreath. "Previously, our batch tests for *C. diff* generated results in 24 hours. Now we produce results for most patients in as little as one hour, and if PCR tests are needed, not more than two to three hours. Clinicians recognize the significant benefits from this improvement." *(See sidebar at right.)*

"Our diagnostic algorithm gives us better overall sensitivity because the original EIA was not very sensitive," stated Culbreath. "Our new test methodology has enhanced sensitivity.

"Because of that improved sensitivity, we can limit testing to one specimen per patient per episode of diarrhea," she added. "This significantly reduced the need for serial testing for *C. diff* that we did previously with the less sensitive ELISA test.

Rates of Diagnosis Climbed

"Our data shows that we cut serial testing for *C. diff* by 41.5%," she observed. "Better yet, with the improved sensitivity of our new methodology and protocols, our lab increased the number of patients identified with *C. diff*. This is a valuable benefit to our client hospitals, who all have programs to reduce hospital-acquired infections.

"This is an interesting point and strikes to the heart of the ongoing discussion in labs about cost-per-test versus cost-per-diagnosis," added Culbreath. "We cannot say all of that increase in the *C. diff* detection rate is due to the change in our testing methodology and algorithm. There could be an increase of *C. diff* in the community or because of other factors.

C. Difficile Test Changes Deliver Improvements

TWO YEARS AFTER implementing new methodologies and protocols for *Clostridium Difficile* (*C. diff*) testing, TriCore Reference Laboratories has delivered significant improvements that have contributed to improved patient care. TriCore provided these key metrics on its *C. diff* testing program:

- **TURNAROUND TIME (TAT):** 80% decrease, from average of 37 hours (EIA) to average of 7 hours (PCR).
- **LESS SERIAL TESTING:** Reduced from 68 tests-per-1,000 (EIA) to 7 tests-per-1,000 (two-step PCR).
- **IMPROVED DIAGNOSIS:** New two-step PCR test and algorithm increased *C. diff* positive rate by 121%.
- **REDUCED COST PER DIAGNOSIS:** Despite higher cost per test, new PCR test and algorithm reduced the lab's average cost-per-diagnosis for *C. diff* by 40%.

"The point is that when we switched to this new algorithm, our rates of positive diagnosis for *C. diff* went up and we reduced the cost-per-diagnosis, which is an important factor for us," she observed. "The algorithm we currently use calls for a slightly more expensive first step and a much more expensive second step. However, because we don't have to run serial tests because of the lower sensitivity of the ELISA assay, we reduced the average cost per *C. diff* diagnosis.

"This is an important benefit that might be overlooked if we didn't emphasize it," Culbreath stressed. "It's easy to compare the cost of one test to another and take steps to shift utilization to the lower-cost test.

"But the cost-per-diagnosis is more complex than that," she emphasized. "We want to help clinicians get to a more efficient and less expensive diagnosis overall

for their patients. Our two-step *C. diff* algorithm allows us to do that."

Crossey was quick to point out that TriCore's capability to reduce both the time to diagnosis and the average cost of diagnosis for *C. diff* created an opportunity for the laboratory's pathologists to engage client hospitals in a new way.

"One of our sponsors is **Presbyterian Hospital**, which the federal **Centers for Medicare & Medicaid Services** (CMS) has designated as a Pioneer ACO," said Crossey. "All ACO models are designed to improve efficiency and Presbyterian is no exception.

"Our lab team is in discussions with Presbyterian's medical staff to help them consider the value of the downstream effects that result from improved use of laboratory testing," he said. "For example, if better use of lab testing allows the hospitals to take a patient out of isolation sooner or de-escalate antibiotics sooner, or change to the correct antibiotic more quickly, then there are substantial cost savings associated with each of those improved outcomes.

Lab Scientists Do Rounds

"We are demonstrating these points in actual practice," continued Crossey. "Dr. Culbreath, Stephen Young, Ph.D., also a scientific director of infectious disease, and I go on infectious disease rounds every Monday with the infectious disease physicians and the infectious disease pharmacists, for example. When it comes to antibiotic stewardship, that trifecta is a very powerful team."

"We believe that having this kind of relationship with our referring physicians will propel us into the next era of lab medicine," added Culbreath. "In that era, it will be more about the clinically-actionable information labs can deliver as opposed to simply delivering lab test results." TDR

—Joseph Burns

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Two-Step *C. diff* Algorithm Incorporates PCR Testing

CHANGING THE EXISTING TEST METHODOLOGY was one way the team at TriCore Reference Laboratories believed it could improve testing for *Clostridium difficile* (*C. diff*) infections and deliver more value to referring physicians while contributing to improved patient outcomes.

"At that time, we used an enzyme immunoassay (EIA) when testing for *C. diff*," stated Karissa Culbreath, Ph.D., a Scientific Director of Infectious Disease at TriCore. "An alternative approach to our existing protocol involved using a two-step algorithm to detect the two markers for *C. diff:* glutamate dehydrogenase antigen (GDH) and the *C. diff* toxin. Under this algorithm, we could test every sample in a time frame that is close to STAT testing.

"We adopted the use of a card-based assay that—in terms of speed—is about as fast as point-of-care testing, but it is run in our central laboratory," commented Culbreath. "If the card-based assay showed both the GDH and *C. diff* toxin were positive, we would consider the patient as being positive for *C. diff.*

"That result takes about 30 minutes," she said. "If the test showed the patient to be negative for both markers, we consider the patient to be negative for *C. diff* infection.

"The problem was that only about 85% of results with this assay are either both positive or both negative for *C. diff*," Culbreath emphasized. "The remaining 15% of tests generate one positive and one negative for these two markers.

"It is for those samples that we then perform the more expensive PCR test," she commented. "Our lab produces that result in just 60 to 90 minutes. This improves the accuracy of the *C. diff* diagnosis and greatly shortens the time-to-answer for our referring physicians."