Point-of-care testing:

an opportunity to improve patient care through implementation of new technology and optimization of internal resources

Rick Savage, MBA, RRT
Director, Cardiopulmonary Services, Summerlin Hospital*
Written in conjunction with Abbott Point of Care

ABSTRACT

Background: Patient delays in the emergency department (ED) at Summerlin Hospital were unacceptably high, in part because of slow turnaround time to obtain laboratory test results. A program that included point-of-care (POC) testing was initiated with the goal of reducing ED length of stay.

Methods: The role of the respiratory therapist (RT), who was already working in the ED assisting with routine arterial blood gas analysis, was expanded to include performance of POC testing (i-STAT®, Abbott Point of Care, Princeton, NJ). Initial resistance and concerns of the clinical laboratory staff were addressed, and RTs were appropriately trained and licensed. A phased roll-out of the i-STAT System was implemented. During the initial phase, tests for cardiac markers including troponin I were implemented to reduce the time needed for accurate diagnosis and proper disposition of patients presenting in the ED with cardiac symptoms.

Results: Obtaining accurate cardiac marker values with the i-STAT System quickly decreased length of stay in the ED and improved patient throughput. Breaking traditional professional constraints by integrating the RT as part of the ED team increased both the level of professional satisfaction of the RT and collaboration with nurses and physicians. At this time, use of the i-STAT System is being expanded even further throughout the hospital.

Conclusion: Identifying a hospital goal that can be achieved with system changes such as the use of i-STAT POC testing is an important first step in improving patient care. Using the i-STAT System to measure critical cardiac markers and having the RT serve as a champion for implementing this technology helped achieve the goal of reducing length of stay in the ED at Summerlin Hospital. This success in the ED has become the basis for expansion into other clinical areas of Summerlin Hospital and its healthcare network.

* Rick Savage was employed by Summerlin Hospital at the time the captured events occurred. However, he has recently transitioned to sister hospital Desert Springs Hospital Medical Center as Director, Cardiopulmonary Services.

BACKGROUND

Summerlin Hospital Medical Center is an acute care facility located in southern Nevada. It has 281 licensed beds, 1,100 employees, and more than 1,400 physicians on staff. The hospital has adjoining outpatient services for surgery, laboratory, and radiology, and two medical office buildings. There is a $100 million expansion project that will increase the number of licensed beds to 480 by 2010. The project includes the addition of more labor & delivery and recovery suites, antepartum and postpartum suites, and more rooms for neonatal intensive care, medical telemetry, and postoperative patients. Summerlin Hospital is associated with Valley Hospital Medical Center, Desert Springs Hospital Medical Center, and Spring Valley Hospital Medical Center.

Patient delays in the ED were unacceptably high at Summerlin Hospital. To resolve this problem, a program was initiated to achieve a goal of having every patient stay in the ED for no longer than 120 minutes (TED120 initiative). Within these 120 minutes, each patient would need to be registered, triaged, and have initial diagnostic tests completed to enable decision-making about admission to the hospital or discharge. Early in the strategic planning for the TED120 initiative, diagnostic testing was identified as an area for process improvement because the turnaround time for receiving the results of laboratory tests from the central laboratory often exceeded 2 hours. It was believed that implementation of i-STAT POC testing was one way to speed analysis time and accelerate receipt of test results.

METHODS

Implementation of i-STAT POC testing: expanded role of the respiratory therapist

Traditional blood gas analysis was being performed by RTs in the ED using a bench-top device. In an effort to streamline services and make optimal use of staff capabilities, the role of the RT already assigned to the ED was expanded to include POC testing. In the state of Nevada, because RTs obtain licensing both as blood gas laboratory technologists and general laboratory supervisors, the RT was able to become licensed for POC testing. Training in POC testing was provided so that RTs understood not only the technical aspects of a given test, but also knew its purpose and could identify critical values that required immediate action. RTs were included in the earliest strategic planning meetings and played a key role in implementing and monitoring the success of the project. Respiratory therapy had responsibility for all elements of POC testing, including billing, technology interface, data management, quality control, education, staff performance proficiency validations, and inventory control.

Implementation of i-STAT POC testing: a phased approach

The first phase of implementing POC testing was the analysis of cardiac markers in the ED. Timely, accurate cardiac marker levels are needed to determine the clinical status of patients with symptoms of acute coronary syndromes. Blood samples for cardiac markers were analyzed using the i-STAT System during this initial phase of the project. Protocols incorporating the i-STAT System for the testing of cardiac markers were developed by the physicians and implemented in the ED for cardiac patients.

The second phase added blood gases and chemistry panels, including use of the i-STAT System for blood gas analysis hospital-wide. Phase 2 is ongoing and data are still being collected. Preliminary results from the first phase are available and are presented in the following pages.

RESULTS

Following the implementation of POC testing with the i-STAT System, physicians recognized changes, including a decrease in waiting room time, an increase in speed of decision-making with regard to patient discharge or admission, and a decrease in "door to balloon" time in the STEMI protocol. Preliminary review of the data suggests a reduction in the time patients spend in the ED, and a decrease in the turnaround time for cardiac marker analysis from more than 2 hours to less than 20 minutes from physician order to results reported.

Rather than conducting testing through the central lab, POC testing brings the laboratory to the patient's bedside. The RT is the only interface needed and

Rather than conducting testing through the central lab, POC testing brings the laboratory to the patient's bedside.

therefore communication problems are largely eliminated. The blood analysis process is simplified and hence less prone to errors, and the ability to make clinical decisions is improved because all caregivers (RT, nurse, physician) can be involved in diagnosis and treatment decisions when the results of diagnostic tests are readily available. Team-based discussions ultimately result in better decisions since all aspects of patient care are considered. The interface and integration of POC testing with hospital and central laboratory information systems can also facilitate management decisions.

DISCUSSION

To implement POC testing, Summerlin Hospital broke traditional professional constraints of the RT by expanding his/her clinical role both in the ED and, in later phases, across the entire hospital. New responsibilities for RTs required that both regulatory and staff perception issues be addressed.

To implement POC testing, Summerlin Hospital broke traditional professional constraints of the RT by expanding his/her clinical role both in the ED and, in later phases, across the entire hospital.

Besides the clinical aspects of this program, implementing the data management, reporting, and billing components required cooperation from the clinical laboratory and regulatory approval. Approval from the state of Nevada to add POC testing to the existing state license for RTs was contingent upon support from the College of American Pathologists (CAP). The support of CAP was obtained by means of onsite surveys and documentation of the extensive and thorough education required of the RT. Evidence of this appropriate licensing and extensive education was also needed to overcome the objections of the clinical laboratory team. Throughout this process, both the RT medical director and the pathologist director served as champions to gain support for approval. With the support of CAP in place, the state scheduled an onsite accreditation survey after which approval for licensing RTs to use POC testing was granted.

From a clinical staff perception perspective, there was initial resistance to the program by the medical staff and nursing staff based on historical perceptions of the traditional role of the RT. However, this eventually changed as physicians and nurses increasingly interacted with the highly trained and appropriately credentialed RT in his/her expanded role in ED care. Similarly, the increased interaction between the RT and the clinical laboratory staff (eg, phlebotomists at the bedside, other staff in the course of instrument

calibration) ultimately led to an increase in mutual collaboration and respect. Physicians in the ED became local champions for this program and were the first group to support having RTs perform POC testing. They were followed by the medical director of RT, and later, the pathologist who was medical director for both the central clinical laboratory and POC testing. The nurses also became strong supporters of the new RT role as they interacted and collaborated with the RT in activities involving care of cardiac patients. Support by these groups was critical in assuring the ongoing success of the project. As a result, the RT has become an integral member of the ED team.

Also key to the success that Summerlin Hospital was able to achieve with the i-STAT System was the use of a phased approach to gain experience and support of the clinical staff and administrators. Initial POC testing was conducted with cardiac enzymes. Other test applications implemented with the i-STAT System included the testing of blood gases throughout the hospital, including the ICU, and use of the CHEM8+ panel in the ED. The medical staff continues to support the expansion of these services throughout the hospital, including in adult and neonatal units, and the use of other tests in the ED population.

Other test applications implemented with the i-STAT System included the testing of blood gases throughout the hospital, including the ICU, and use of the CHEM8+ panel in the ED.

Future expansion requires that POC testing results interface with the laboratory information system and hospital information system so that both electronic and paper reports are available. Other hospitals in the network have expressed interest in this technology and its integration. As a result, Summerlin Hospital and the RTs who now provide this bedside diagnostic technology throughout the hospital may be able to take the lead in implementing POC testing in other hospitals.

SUMMARY

Identifying a hospital goal that can be achieved by introducing changes such as the use of i-STAT POC testing is a crucial first step in improving patient care. At Summerlin Hospital, using the i-STAT System for testing of critical cardiac markers helped achieve the goal of reducing waiting time in the ED. The value of this new technology and the expanded clinical role of the RT resulted in shorter times for ED admission and discharge. Intangible benefits have been the increased professional satisfaction of the RT and the bridges that have emerged between the clinical laboratory staff and other caregivers. The success that the ED realized with the i-STAT System during this first phase of the project has formed the basis for expansion into the rest of the hospital and its healthcare network.

Intangible benefits have been the increased professional satisfaction of the RT and the bridges that have emerged between the clinical laboratory staff and other caregivers.

400 College Road East, Princeton, NJ 08540
(609) 454-9000
(609) 419-9370 (Fax)
www.abbottpointofcare.com

021499 Rev.A 3/09

Abbott Point of Care