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# Partnering for Better Pregnancy and Blood Gas Testing

Helping NHS Lanarkshire minimize clinical incidents in central Scotland's hospitals

Clinical Case Study

Answers for life.



# “RAPIDComm-interfaced point-of-care testing significantly reduces the potential for errors in the care we provide.”

Jacqueline McGuire  
Consultant Clinical Scientist  
Department of Clinical Biochemistry  
NHS Lanarkshire, Scotland

NHS Lanarkshire, part of the UK's National Health Service, has three main acute care hospitals in central Scotland. Together, Wishaw General, Monklands, and Hairmyres support more than 1,600 inpatient beds, offer 24-hour accident and emergency (A&E) provision, and deliver comprehensive care across multiple specialties including maternity; dermatology; ear, nose, and throat (ENT); pediatric neonatal care; renal care; and coronary care.

The many specialties across the three main sites of NHS Lanarkshire are supported by diverse critical care tests that take place at multiple locations, both in the laboratory and at the point of care (POC). “Testing has to be fast, and the test results that get to the physician have to be both accurate and reliable,” notes Jacqueline McGuire, consultant clinical scientist and clinical lead for POC testing at NHS Lanarkshire.

**“Staff can remotely monitor our POC analyzers and perform troubleshooting without going out to the wards.”**

Jacqueline McGuire

“Our Biochemistry Department alone receives well over a million test requests each year. With that level of throughput, we always have to be on the lookout for ways to minimize the potential for errors at every stage of the testing and reporting process, both in and out of the lab. Errors at any stage can lead to clinical incidents with major consequences.”

Jacqueline McGuire observes that many clinical incidents arise as a result of human error. In the three-year period spanning 2005–2007, NHS Lanarkshire recorded eight clinical incidents involving lab-based pregnancy tests. In one incident, sample tubes within a rack were transposed and not checked prior to analysis. Four incidents involved operators not reading the result correctly, and three arose from manual transcription errors. “We recognized that our pregnancy testing was dependent on many manual steps, which had to be eliminated as best we could,” says McGuire. “We decided to search for ways of preventing future errors, and we knew that Siemens Healthcare Diagnostics could help us with that. Previous experience had shown us that analytical solutions from Siemens are designed to minimize the potential for human error in critical testing.”

The end result of that search was NHS Lanarkshire's decision in 2010 to pioneer pregnancy testing in the UK on a CLINITEK Status® Connect urinalysis system. The CLINITEK Status Connect system was interfaced to the RAPIDComm\* Data Management System for enhanced control and management. The RAPIDComm system was then interfaced to the hospital's Laboratory information system (LIS). The decision paralleled NHS Lanarkshire's

successful standardization of its blood gas testing program on analyzers interfaced to RAPIDComm systems, and reinforced an already long history of partnership with Siemens in the field of critical care testing.

The RAPIDComm Data Management System is a Siemens solution that provides POC coordinators with the connectivity to oversee and manage multiple urine and blood gas analyzers in real time, all from a single location. Wide-ranging capabilities include the ability to remotely access and troubleshoot connected instruments, manage operators, view live screens, generate QC reports, and even take direct control of RAPIDLab® 1200 and RAPIDPoint® 400 Blood Gas Analyzers from the laboratory or office.\*

Easy-to-use analyzers that interface with the latest data management and connectivity solutions can together “reduce the opportunity for operator errors, make it easier to detect errors, and make it possible to rectify them,” says McGuire. “An early step in the move toward a complete RAPIDComm-based solution was to roll out much of our pregnancy testing on CLINITEK Status+ urinalysis systems.”

CLINITEK Status+ analyzers from Siemens are deployed across all three main sites at NHS Lanarkshire. They are used for both pregnancy and routine urinalysis testing, in early pregnancy units, day surgeries, dermatology departments, and an A&E unit. These intuitive systems eliminate the need for manual data entry, and offer advanced quality checks (Auto-Checks)

\*Functionality varies by instrument.

for urine strip testing to improve the accuracy of clinical information, including automatic checks for common sample interferences.

“Pregnancy testing throughput on CLINITEK Status+ analyzers runs to about 7,000 tests per annum at POC locations,” McGuire comments. Nine other analyzers in NHS Lanarkshire’s laboratories bring that total up to almost 19,000 pregnancy tests each year. “Our CLINITEK Status+ systems reduce errors in a number of ways,” she adds. “They solve the problem of having to accurately time tests, they prevent results from being read incorrectly, and they provide a semi-permanent record of the result. But we wanted to go that extra mile because we were still observing a small number of clinical incidents with pregnancy tests. A sample mix-up led to one result being entered into the wrong patient file—and we still hadn’t completely eliminated transcription errors.”

Going “the extra mile” to minimize pregnancy test-related clinical incidents at NHS Lanarkshire commenced with a successful six-week trial of the CLINITEK Status Connect urinalysis system.

The CLINITEK Status Connect system combines the CLINITEK Status+ analyzer with a connector platform to send data, via the RAPIDComm interface, to NHS Lanarkshire’s LIS. Bar code scanning of patient ID and the automatic transmission of patient and QC results to the LIS eliminates transcription errors, streamlines documentation, and improves productivity.

“RAPIDComm doesn’t just facilitate electronic data transfer and reduce the paper trail. It can provide us with the remote oversight we need to manage all of our pregnancy testing, facilitate compliance, and improve risk management,” says McGuire. “We can lock out untrained operators, program varying levels of system access, standardize protocols, and even lock out the analyzer if quality control conditions are not met. We can trace reagent lot numbers and expiry dates, and generate QC documentation and reports as and when needed.”

Jacqueline McGuire is enthusiastic about the support Siemens has provided—and is continuing to provide—as the CLINITEK

Status Connect project rollout continues. “A fantastic team from Siemens has worked with us throughout this project. We had some minor issues at the start—after all, we are one of the first sites to trial the CLINITEK Status Connect system—but they were resolved quickly. The team liaised closely with our LIS supplier to ensure the smooth transfer of results and data.”

### “The RAPIDComm Data Management System helps us comply with point-of-care testing and laboratory CPA standards.”

Jacqueline McGuire

“We hope to complete the rollout of more CLINITEK Status Connect systems to all POC pregnancy testing sites in the near future. We will be having our first Clinical Pathology Accreditation (CPA) inspection for Point of Care next year. I am sure that the new systems, together with RAPIDComm, will assist us in complying with the necessary standards.”

Siemens also supports NHS Lanarkshire with online learning, a Technical Solutions Center for helpdesk troubleshooting, and a flexible, hands-on approach to operator training. Janet MacLaren is the Siemens customer education specialist for NHS Lanarkshire. She works closely with Elaine Kennedy, internal POC coordinator for the three Lanarkshire sites, to provide pregnancy, urinalysis, and blood gas

training for new staff, and refresher training when required. “All of the training I provide follows NHS Lanarkshire’s Standard Operating Procedures,” says MacLaren. “Over the last year, I’ve trained 179 people. I’m frequently on-site to give blood gas training to new doctors on rotation.”

Blood gas testing completes the RAPIDComm solution story at NHS Lanarkshire. To standardize testing at Wishaw, Monklands, and Hairmyres, a total of 14 RAPIDLab 1200 Blood Gas Analyzers are located in laboratories, A&E units, intensive care units, an acute coronary care unit, a neonatal unit, and on a maternity ward. They offer an all-inclusive test menu encompassing blood gas, electrolytes, metabolites, neonatal total bilirubin, and full CO-oximetry. Thanks to the RAPIDComm Data Management System, Jacqueline McGuire and her team can monitor, manage, and control each of these analyzers from their office or while on the road visiting the other hospital sites utilizing RAPIDComm remote management capabilities.

“I’m convinced that the RAPIDComm Data Management System reflects a commitment by Siemens to help its POC partners reduce clinical incidents, ensure quality, and improve productivity in critical care testing,” concludes McGuire. “It is a system that is certainly achieving all of that for us. We now have a single interface for the management of pregnancy and blood gas testing—a single platform that reduces and simplifies connectivity to our LIS, integrates oversight, and streamlines our workload.”



Hairmyres Hospital, Scotland

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