

Roadmap to success: how to prepare for POCT of blood gases

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England's Oxford Radcliffe Hospitals have a POCT system they consider a success. This is a roadmap of the steps they have taken.

The Oxford Radcliffe Hospitals NHS Trust has roughly 1,400 beds on its four sites.

In 2000-01 more than 400,000 people attended outpatients, some 110,000 patients were admitted, 110,000 people attended accident and emergency, and more than 7,000 babies were delivered. Turnover for the year was in excess of £275 million and over 10,000 people work on the sites, including those in the Universities and major research institutes.

There are currently 18 blood gas analyzers across four sites. An average of 300-400 samples are taken everyday. Blood gas and related parameters together with blood glucose are the only parameters measured at the point of care.

Blood gas analyzers are maintained and supported by the Clinical Measurement (CM) group of the Department of Medical Physics and Clinical Engineering at the John

Radcliffe Hospital. The group is made up of nine people: one Clinical Scientist, one administrator, and seven full-time equivalent technicians.

According to Dr Eileen Palayiwa, Head of the Clinical Measurement group, point-of-care testing of blood gases has been performed since the early 1970s at Oxford Radcliffe. "In the past, instrument purchases were based primarily on capital costs and were often uncoordinated," Dr Palayiwa explains. "This resulted in a mix of instruments from four different manufacturers."

Dr Palayiwa realized that support, training, and purchasing could be more efficient if a coordinated approach could be agreed and equipment could be standardized throughout the Trust. In 2001, she initiated a process to identify a better solution.

Put together a project group/committee

To start, users from the various clinical departments were brought together via a medical equipment-purchasing group and a committee was set up.

The committee was made up of senior members of Clinical Measurement, Senior Consultants and nurses from the clinical areas where the new analyzers were being placed, together with representatives from the Procurement Department and the Biochemistry Department.

The committee defined and agreed on a specification list to be used when talking to suppliers. At all stages, the purchasing department was involved to ensure a proper audit trail of the process.

Define daily procedures and roles

When preparing for point-of-care testing, there are many practical aspects to be considered. Roles and procedures must be defined: Who will be responsible for training? What about maintenance and the general logistics?

How will the wards be billed for the tests they run? How about the flow of patient and analyzer information? Who gets which information - and most importantly, how?

"The clinical demands/specifications were determined before we went to tender, i.e. from the word go," says Elizabeth Clarke, Principal Technician, Clinical Measurement Group.

"The Clinical Measurement group has run the blood gas service since its humble beginnings back in the last 1960's," she continues. "Therefore, there was no question as to who would maintain the analyzers."

In addition to analyzer maintenance, it was established that the Clinical Measurement group would be responsible for all quality control, troubleshooting, and inventory control pertaining to blood gas analyzers, plus training, which is something the group always has done.

The possibility of having head nurses conduct training was discussed at some point. However, in order to secure uniform training and avoid information from being "watered down" in the process, CM continues to be in charge of training.

Each ward was to have their own policy about who would analyze blood gas samples. In intensive care areas, nurses have always been happy about running their own samples, so it was only natural for them to continue to do so with the new setup. In other areas, it was more natural for the medical staff to run them.

The committee also looked at which information flow they would like to have from their POCT set-up. The goal was to automate as many tasks as possible through an analyzer management system software.

Analyzer data was to be automatically sent to CM, while patient results should go directly to the biochemistry lab. Furthermore, CM wished to have remote control over individual analyzers and data.

"We weren't sure during the tender procedure that we would definitely use password control but the more hospital sites we visited the more it looked like a good idea," Elizabeth Clarke adds.

Talk to different suppliers and test their products

Once the manufacturers submitted their tenders, Oxford Radcliffe arranged for them to come in on trial for two weeks each. Six suppliers were invited to provide an analyzer for two weeks for use in busy locations at Cardiac Recovery and Theatre Recovery (two manufacturers at a time).

People from many different departments used these instruments. The users filled in questionnaires for the various models and these were analyzed.

"While the analyzers were on trial, we sent Global emails around the hospitals inviting all those interested to come and view them and make any comments on the questionnaires," says Elizabeth Clarke. "These included consultants, all medical staff, nurses... - even people from areas that may be looking for a new analyzer in the next couple of years."

"The questionnaires were left next to the analyzers.

Everyone and anyone filled these out," Elizabeth Clarke continues. "Basically we needed as much feedback as possible. Clinical Measurement had their own questionnaire addressing technical concerns e.g. automatic quality control and maintenance levels. Because most places getting the new analyzers already had one, we knew the local demands in advance. Nevertheless, we wanted to know more about ease of use, time for results, etc."

Once the POCT committee had received all the questionnaires, they produced a table of all the findings (good and bad) to help them with their final decision.

Research what peers are doing

Site visits were also an important milestone in Oxford Radcliffe's evaluation process. During two months, the POCT committee visited six hospitals (one for each manufacturer) to assess their long-term experiences with point-of-care testing of blood gases.

According to Elizabeth Clarke, the committee could not have done it without their input. "During tenders, suppliers will focus on the positive aspects of their solutions. And that's fine - after all, that's their job. But we wanted to know how the solutions really worked in real hospitals over a period of time. The only way we could go about it was visiting these hospitals," she says.

Make a decision

After talking to peers and testing different equipment thoroughly, it was time for Oxford Radcliffe to make a decision.

A subgroup of eight people evaluated the information and short-listed three manufacturers, which was reported to the wider group. A recommendation was then made and the financial implications examined.

Once the hospital decided on a supplier, a contract was signed and a program for the installation of eleven analyzers and training of 800 nurses was prepared and initiated.

Evaluate the system and the process leading up to it Oxford Radcliffe feels they have a well-functioning POCT system in place. With some budget delays the process from start to installation took about 18 months. "The consultation process is vital and should not be rushed," says Dr Eileen Palayiwa. "We have also benefited tremendously from visiting other hospitals and learning about their experiences."

Standardizing and expanding Oxford Radcliffe's POCT setup has saved the institution money in various ways. The Clinical Measurement group provides a more efficient service, while training and password-protected analyzer access have improved end-users' competence.

All in all, the hospital enjoys a more controlled and reliable blood gas service with better documentation.

Plan for future developments

There are no definite plans to optimize the POCT system as a whole. However, Oxford Radcliffe will be optimizing some parts of it.

Future plans include finalizing standard operating procedures and refresher courses as a follow-up for their standard training program. On their list is also the linking of all patient data to the electronic patient records in the HIS/LIS system via their current analyzer management system software.

"We also wish to be able to add and remove passwords remotely - not only on a single analyzer, but on a number of them simultaneously," Elizabeth Clarke adds. In addition, a POCT committee has been formed to look into expanding measurement of blood glucose at the point of care.

"We have a good system in place, and that makes it easier to continuously update and expand it," concludes Elizabeth Clarke. "Now we are the ones being visited by other hospitals wanting to implement point-of-care testing of blood gases."

Interviewees

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