

MOVING UP THE AGENDA: MACHINE POWER ISSUES

Experiences of implementing and analysing automation and an analysis of the current information technology issues in hospital pharmacy were set out in the afternoon session of the Hospital Pharmacist conference. Rachel Graham reports

Experiences of implementing automation at the Llandough Hospital were set out by Cheryl Way, principal pharmacist at the hospital. She explained that a three phase project to install automated pharmacy systems (APS) in Welsh hospital pharmacies had been submitted to the Assembly Government in 2002 by the Welsh chief pharmacists' committee. Funding for the first phase (the three sites of West Wales General and Llandough hospitals and Ysbyty Glan Clwyd) was announced in January 2003, with contracts being awarded to ARX in April 2003 (following a tender process) and the systems being installed in all three sites by December 2003. Project groups at each site were set up to manage the implementation, working closely with each other.

Building work necessary, not only to accommodate the robot but also to ensure that the department was designed around it, started in May 2003. This included removing walls in the dispensary and adding a raised section of roof to give enough room for the conveyors to work properly. Air conditioning also needed to be installed, as did new flooring and fittings.

It was also necessary to change the way pharmacy services were provided, in order to reduce the volume of work coming into the dispensary during the period of disruption. Starting from the end of July 2003, additional ward pharmacy services were started and returns for processing were no longer accepted. From early September, the dispensary was relocated to the dressings' store and additional portering rounds and Saturday visits to all wards were put in place to reduce further the dispensary workload. In addition, only FP10HPs were issued from outpatient clinics.

The machinery itself was delivered in mid-September. Unloading it took three hours and assembling it two weeks, with engineers working 12 hour days during that period. Fridge units were installed about a month later, with the system going live at the start of November.

Now the APS is up and running, the dispensary and ward box assembly areas are much tidier and more pleasant to work in than they were before the implementation



Cheryl Way: automation has created a tidier working environment

process began. Noteworthy features of the system include a bi-directional interface between the pharmacy computer system and the robot and a remotely-accessible dispensing facility for on-call requests. The system also has a functioning labelling module, which is believed to be the first of its kind in the UK. There are plans to include controlled drugs in the robot. Stock reconciliation, automatic receipt of goods and the over-labelling of bar-coded prepacks are also being worked on.

From a wider Welsh perspective, phase 2 of the project is now underway, with APS systems (to be supplied by Westfalia) due to be installed in the Royal Glamorgan, Princess of Wales, Bridgend and Royal Gwent hospitals in the near future.

HEALTH ECONOMISTS' VIEW

Information about the economic and political background to automation was set out to delegates by Ceri Phillips, reader at the Centre for Health Economics and Policy Studies at the University of Swansea.

Starting with efficiency, Dr Phillips explained that, as health professionals, maximising the resources that are available is one of the duties of pharmacists. Although the full cost-benefits analysis of automation in Wales is not complete, there is a need to consider different ways of working, such as automation. For example, according to a recent article in *The Times* newspaper, ineffi-



Ceri Phillips: increasing efficiency and reducing dispensing errors are Government targets

ciency costs the NHS £6bn each year. Dr Phillips pointed out that one US study showed that 4 per cent of the preventable errors that caused adverse drug events were dispensing errors, with another study giving the figure as 11 per cent. Even though the percentages are small, removing or reducing such errors can have an important impact, given the overall scale of the problem. For example, adverse drug events as a whole cost the NHS £380m per year and take up 4 per cent of available bed days. In addition, research in one health authority suggests that the volume of negligence claims doubled between 1990 and 1998.

Preventing errors is a key Government target that requires a "person" approach and a "system" approach, he said. As well as having, for example, a fair blame culture, the system approach includes building defences to avoid error and evaluating the processes that are subject to error. To this end, the UK dispensing error analysis scheme has shown that there is an overall error rate of 18.1 errors per 100,000 items dispensed, with the most common error (accounting for 23 per cent in the 2004 survey) being the dispensing of the wrong strength of the right drug.

Although there is political impetus behind automation, there are only limited published data to demonstrate improved accuracy over traditional manual dispensing systems. Hence the importance of the research undertaken in Wales, Dr Phillips said.

What did the research reveal about the effects of introducing automation?

Details about the multicentre study to assess the costs and benefits of implementing automated pharmacy systems (APS) (ie, automated dispensing and ward stock distribution system) were explained to delegates by Cate Whittlesea, senior lecturer at the Welsh School of Pharmacy, Cardiff.

Dr Whittlesea first set out the preliminary work that was carried out before the data collection began. This included determining the type of data that is needed to evaluate the impact of the robot rather than the pharmacy computer system (eg, regarding stock) and establishing how it could be obtained. To do this, the study group approached pharmacy staff at other hospitals with automated dispensing systems, as well as the system supplier. They also assessed the data and methods already available from other sources, such as projects to benchmark the dispensing rate at Welsh hospital pharmacies.¹

The preliminary work showed that some of the requisite data would be available automatically from the drug issue statistics on the EDS pharmacy computer system (including information about stock issues in connection with inpatient, outpatient and discharge prescriptions, ward requisitions, internal orders, stock adjustments and inter-location transfers made). For other categories, (ie, determining the dispensing rate and skill mix) existing data collection methods could be used, although the data itself would need to be collected afresh. New methods would need to be developed to assess outpatient satisfaction, ward staff satisfaction, attitudes of pharmacy support staff, dispensing incidents and work load (relating to ward box assembly). Preliminary work also included developing the study protocol and questionnaires (Sue Ashwell from Kettering General Hospital assisted with the development of the latter). Further details about the methods used are set out in an article in the July/August issue of *Hospital Pharmacist*.²

Dr Whittlesea told delegates that the study showed that the introduction of automated dispensing was associated with a reduction in the turn around time for discharge prescriptions. The median time was reduced from 96.8 to 61.1 minutes at West Wales General Hospital and from 65.5 to 60.3 minutes at Llandough Hospital. There was also a reduction in turn around time for outpatient prescriptions, from 8.1 to 6.6 minutes at West Wales General Hospital and from 20.0 to 16.4 minutes at Llandough. The dispensing rate also increased — from 11.6 items per person per hour to 15.7 items



Cate Whittlesea: results of the Welsh project help address the lack of data about automation

per person per hour at Llandough. Outpatient satisfaction also improved, with respondents noticing the reduction in the time they waited for their prescription and considering pharmacy staff to be less busy, less stressed and less harassed. However, respondents also considered staff to be “less interested” post-automation than they were pre-automation.

Dispensing errors were also reduced, by either an average of 2.6 or 2.9 per 10,000 items dispensed at Ysbyty Glan Clwyd (depending on which post-automation period was analysed), 2.0 per 10,000 items dispensed at Llandough Hospital and 3.6 per 10,000 items dispensed at West Wales General Hospital. With regard to workload, the implementation of automated dispensing was associated with a decrease in the amount of time staff spent processing stock orders and requisitions at West Wales General and Llandough and an increase the amount of time spent on ward top up activ-

The time taken to dispense prescriptions has reduced post-automation

ities at Llandough and Glan Clwyd hospitals. There were also decreases in the amount of time staff spent tidying the ward distribution and stock holding areas, in transfers of stock between hospitals and in internal orders. Distribution incidents reduced from 12.9 per 1,000 items distributed to 7.2 per 1,000 items distributed. Ward staff were also more satisfied with aspects of the service they received post-automation. This included those relating to increased pharmacy opening times and a reduction in the amount of time spent on the annual stock audit undertaken at the Llandough Hospital site. Pharmacy technicians were generally positive about automation — their main concern was that the robot would constantly break down.

Whether or not implementing automation saves money has not yet been fully evaluated. So far, the value of stock held has decreased at only one of the three sites and has actually increased at the other two.

Dr Whittlesea acknowledged to delegates that there are limitations to the project. For example, data was collected for short periods of time both pre- and post-implementation. The extensive building work carried out at two sites to accommodate the automated dispensing equipment might also have influenced some of the results. Collecting the data was also a fairly new experience for many of the pharmacy staff concerned and resources to carry out second independent checks relating to the dispensing and ward distribution incidents were unavailable. As mentioned above, the financial implications of APS were not completely assessed, and further work needs to be done in this area and in, for example, quantifying the “knock on” benefits of automation on redeploying pharmacy staff to wards and reducing discharge times. In conclusion, Dr Whittlesea said that this was the first multi-centre study of automated dispensing in the UK and that it addresses in part the lack of evidence of the benefits of APS versus traditional dispensing and distribution.

REFERENCES

1. Hiom S, Roberts D, Hawksbee M, Burfield R, Francis M, Walker K, Lord S, Warner N. Benchmarking the current dispensing rate of Welsh hospital pharmacies. *International Journal of Pharmacy Practice* 2003;11(suppl):R85.
2. Whittlesea C, Phillips C, Roberts D, Burfield R, Savage J, Way C. Automated dispensing — how to evaluate its impact. *Hospital Pharmacist* 2004;11:283-5.

What are the current information technology issues in pharmacy?

Pharmacists' perspectives on the current information technology issues in hospital pharmacy were presented to delegates by Mark Duman, from Oakleigh Consulting (who wrote the presentation) and George Gannon, pharmacy operations manager at University College Hospital, London (who stepped in to give the presentation).

Mr Duman conducted telephone interviews with 20 stakeholders, including chief pharmacists, pharmacists with a remit at their trusts for electronic prescribing, system suppliers, agencies and those working on the national programme for IT (NPfIT).

Mr Duman's research highlighted that although electronic prescribing is often considered as a secondary care domain, it is already being used in the vast majority of primary care settings, with GPs and community pharmacists generally also having superior patient records to those in secondary care. From his own perspective, Mr Duman perceived that there has been only limited progress with electronic prescribing in hospitals over the past ten years. Little happened until 2000, because people were worried about what would happen to computer systems over the millennium, but since then the pace has picked up. He also pointed out that the challenges associated with electronic prescribing are more complex in the hospital sector than in primary care, mainly because there are more messaging systems.

The research also revealed that respondents were unclear as to who exactly was in charge of electronic prescribing at the national programme level and what was being done at the interface between primary and secondary care. They also wanted to know which details hospital pharmacists will be able to access from systems and what information they will be expected to contribute.

One aspect of electronic prescribing that Mr Duman thought pharmacists had not completely grasped is that electronic prescribing is not just a pharmacy process. He feels that they might need to "let go" and take "one step backwards to go two step forwards". By this Mr Gannon assumes he means that pharmacists need to free themselves from their pharmacy computer systems (which were the first to develop in secondary care) and think about simplifying what they are doing.

Turning to NPfIT, the research highlighted that communication is a big issue. There is a lot of information out there, but people have to go and get it, rather than



Mark Duman: there has been only limited progress in e-prescribing over the past ten years

it coming to them. In addition, for those not in the loop, it can be difficult to find out information and the only real way to do so is to speak to people.

There is also concern that the date for implementing electronic prescribing has been brought forward. Also, in terms of the contract, pharmacy systems seem to have been forgotten. For example, they do not fit into the radiology model or other systems mentioned. In other words, Mr Duman suggests that tickets to a concert in 2006 have been sold, without the symphony having yet been written and without people knowing which instruments are taking part. Of those who are taking part, some people do not have their instruments yet, and some people who do have instruments have other peoples'.

However, Mr Duman believes that there is light on the horizon, providing there is consolidation, clarification and communication. By consolidation, he means identifying leaders in the electronic prescribing process and making sure that these people are driving change forward. They should also be invited to establish an independent multidisciplinary forum.

With regard to collation, there is a need to look at international evidence, such as research from the US, and find the gaps in this information that need to be filled. There are also several UK studies on electronic prescribing that have been carried out, including those at Addenbrooke's (using Actipodos), Chelsea and Westminster (using IDX) and Doncaster (using JAC) hospitals. Communicating this information, as well as consolidating it, is a vital part of accelerating the process.



George Gannon: We need to have agreed standards and agreed ways to communicate

Evidence of progress is that those working in secondary care are becoming more aware of the "dm and d" dictionary data base (see *The Pharmaceutical Journal* 2004;273:199-200). This is mainly used in primary care, with that of First DataBank's being the generally accepted source in secondary care. That there are two sources is not a problem, as long as people are aware of this and the two sources can communicate with each other. Another demonstration of progress is that people are beginning to understand the NPfIT structure, such as the spine and clusters set up.

FUTURE

Provocative questions about the future of pharmacy services were asked in Mr Duman's presentation. These included whether fewer pharmacists would be needed and whether many services could be outsourced to commercial providers. Mr Duman also suggests that the NHS should come together and create an "open source" environment. Mr Gannon agrees, saying: "We need to have agreed standards and agreed ways to communicate". As an example of this, he explained the recent advances to the NHS e-mail system that allow staff to access their e-mail at home and e-mail, for example, all the procurement pharmacists in a geographical area. This makes the NHS feel more together, Mr Gannon said. Other ways of making the NHS feel more like a single corporate body include the work (being carried out by Microsoft) to develop a hand-held interface to enable computer screens to look and feel similar throughout the NHS, he said.