



PHARMACY AUTOMATION SYMPOSIUM

Friday 2 March 2018

Summary of outcomes of the Symposium

1. Experiences with pharmacy automation in Australian hospitals

1.1. Introduction

From the work *PharmConsult* does in reviewing and advising on hospital medication management practices in general, and pharmacy services in particular, there seems an increasing number of hospital pharmacists, other health care professionals and hospital executives who are considering automation. But there seems often to be uncertainty or a lack of understanding about the next steps to take in working out if, and how automation might make medication processes safer and more efficient.

The Symposium was aimed at increasing this understanding.

The Symposium had two parts:

- The first part was focussed the sharing the experiences and opinion of a number of hospital pharmacists on various forms of pharmacy-based, and ward-based, automation which are being used in Australia today.
- The second part of the Symposium was focused on the process for making good decisions about automation and implementing decisions effectively. It involved a diverse group of specialists in logistics, finance, communication, tenders, implementation and contract management who shared their insights and expertise, from the problem diagnosis and decision-making stage, through to managing relationships with suppliers of automated systems.

The following are some key messages from each of the main speakers.

1.2. The future is better than you think

A creative, stimulating introduction to the Symposium was provided by Future Crunch (Angus Hervey & Tane Hunter) who challenged attendees to recognise the positives and achievements in our lives and in the world around us. They explained that as humans our amygdala draws us towards 'bad news' as a survival mechanism (through our 'negativity bias') in favour of more positive news. However as well as presenting reasons why we should be optimistic about the future (based on critical thinking), Future Crunch also explained that positive messages can be successful messages. As such, and in the context of the Symposium's discussions, that rather than focussing just on the risks when considering and developing business cases for new technology, they encouraged the use of positive messages.

1.3. Introduction to pharmacy automation

Michael Ryan, Managing Director of PharmConsult Pty Ltd laid the foundation for Symposium's presentations by defining pharmacy automation, providing a high level explanation of 'pharmacy automation' and summarising, the key reasons why hospitals automate.

Although pharmacy-based automation are known variously by different names e.g. automated pharmacy distribution systems, automated dispensing systems, or robotic dispensing solutions, and ward / unit-based automation as automated distribution cabinets (ADCs), or automated dispensing devices, automated dispensing machines, pharmacy automation generally involves the mechanical processes of handling and distributing medicines.

Even though pharmacy automation include original pack pharmacy-based dispensing systems, automated dispensing cabinets, single-dose and multi-dose packaging machines, compounding robots, RFID cabinets, controlled substances cabinets, tablet sorters, counters, and packing machines (large & small scale), delivery robots and remote dispensing systems, Michael explained that the Symposium's focus would be on the first four of these technologies. He provided a brief description of each to provide context for the presentations which followed.

Hospitals automate for many reasons and there is evidence in the international literature of hospitals achieving outcomes such as:

- patient safety through reduced medication errors;
- cost control through reduced inventory, returns and pilferage, increased traceability, managing high cost drugs more effectively;
- process control through reduced manual processes, introduction of Lean principles and practice;
- floor space through optimised use of location, condensed use of space;
- increased staff satisfaction through reduced stress, and through providing options to redeploy staff into clinical roles;
- patient wait times by reduction in wait times for discharge and OP prescriptions; and
- stock holding through reduced value of stock on hand.

The take home messages in regard to automation he presented included:

- Make your decisions based on your vision and your needs, not on the market and not what others are doing.
- Automation is not a solution in its own right. It may be part of the solution but this will depend on the problem which needs to be solved.
- You don't need to be an expert in automation to select the right solution - just know the problems you are trying to solve.
- The human factor of technology implementations is as critical as the choice of technology itself.
- 'Automation should not be done just because you can. Automation must serve you, not the reverse'. (Source: Mark Neuenschwander)
- Always keep the end in mind!

1.4. Hospital-wide medication automation: the Royal Adelaide Hospital experience

Anna McClure, Director of Pharmacy, Central Adelaide Local Health Network, Adelaide, provided insights into the automation at the new Royal Adelaide Hospital, including their random (chaotic) original pack pharmacy-based robot, automated dispensing cabinets (ADCs), controlled substances cabinets and automated guided vehicles.

The key messages from Anna included:

- governance of the process is critical;
- 'it's not all about the robots';

- whole of pharmacy change is required as is training and support for pharmacy staff;
- it's important to stick the principles underpinning change;
- it's useful to consider the changes in the context of continuous improvement;
- managing the changes in pharmacy roles is critical, but this is also an opportunity to develop unique career opportunities;
- that there will be a heavy reliance on pharmacy initially from clinical areas, and this should be anticipated;
- the space required for ADCs in clinical spaces must be carefully mapped to ensure that it supports workflow;
- consider all storage needs including, patients' own medicines, S8s and other controlled medicines, and individual patient supply medicines; and
- nursing staff are a powerful influencer so engaged them as much as possible.

Ashley Crawford Deputy Director, Distribution Services, Royal Adelaide Hospital, spoke in more detail of the RAH Pharmacy Department's experience with their random (chaotic) original pack pharmacy-based robot. The key messages from Ashley included:

- communication is key;
- pilot where possible;
- resource adequately;
- use learnings from trailblazers;
- the impacts on storage space in clinical areas;
- ICT support is critical;
- remember core pharmacy services;
- post-implementation support is very important as is the relationship with the vendor; and
- it is important to manage expectations of staff and patients on how much 'quicker' the robot will make things – new processes will take time to embed and so the efficiencies will also take time to appear.

1.5. Original pack pharmacy-based automation: the Princess Alexandra Hospital experience

Lynette Loy, Director of Pharmacy, Princess Alexandra Hospital, Brisbane, introduced attendees to 'Spencer the dispenser' – a channel original pack pharmacy-based robot. 'Spencer' has brought a new calmness and quietness to the Pharmacy Department since its commissioning in 2011. Lynette highlighted that a pharmacy robot is not a 'set and forget' activity, and that ongoing management was required (e.g. new products, IT upgrades) and that well-designed contracts are essential to minimising costs post-implementation.

Lynette offered advice in regard to the need to consider carefully:

- maintenance contracts;
- ongoing costs;
- staff and hardware requirements;
- validating interfaces with IT changes;
- time and cost of replacement when required; and that
- "as soon as you install it is 'old' technology!"

1.6. Automated dispensing cabinets - the experience of Cabrini Health and Eastern Health

Amanda Footit, Director of Pharmacy, Cabrini Health, Malvern, Vic.:

Amanda described the management of a hospital-wide installation of automated dispensing cabinets (over 50 ADCs across three campuses), while Maryanne Molenaar spoke of the experience of Eastern Health with a targeted installation of automated dispensing cabinets in the Emergency Department.

Amongst other benefits, the ADC supported the separation of high risk and sound alike medications as these could be stored in any order (LED lights to guide users to medication location within the cabinet). Direct orders from the ADC to the wholesaler eliminated the need for barcode scanning of orders and critical low reports highlighted any unusual usage in between imprest days (which could then be addressed thereby reducing pharmacy call-ins). Knowledge of where medications are in the hospital at any time helped to manage stock shortages.

In regard to take home messages, Amanda offered these:

- understand your workflow and the change management required;
- engage, communicate and ensure you have all relevant disciplines on board;
- plan and include supporting policies & procedures; and
- ensure appropriate support for go-live and on-going.

Maryanne Molenaar, Systems Pharmacist, Pharmacy Department, Eastern Health, Vic.:

In regard to take home messages, Maryanne suggested these:

- provide dedicated EFT for system administration;
- consult pre-'go live' with ward staff (nurses and doctors if they are going to use the cabinets) and pharmacy staff;
- develop the procedures together and meet regularly;
- the cabinets belong as much to the ward as to the pharmacy;
- stay involved with ongoing support post 'go live';
- be ready to answer questions whenever you go onto the ward;
- be available to demonstrate and explain - hang around!;
- reports and information is fabulous - but the benefit lies in what is done with the reports.

1.7. Unit dose & multi-dose packing machines

Ashlea Shaune, consultant, PharmConsult Pty Ltd, provided an introduction to single-dose and multi-dose packaging, forming the basis for later discussion on value of unit dose packaging in hospitals. Whilst the potential advantage in terms of patient level tracking of medications in hospitals was acknowledged (i.e. closed loop medication management), attendees highlighted that without an electronic medication chart, this advantage was nullified. The greater space required to store unit doses (compared to original packs) was considered a barrier. The pharmaceutical industry was called upon to deliver unit dose packaging for hospitals and for pharmacy to advocate louder for this.

The applications of multi-dose packing were explored as was the impact of reduced staffing and reduced packing error rates in this type of automation. The significantly higher packing rate compared to manual methods provides the opportunity to reduce the number of employees involved in dose packing employees. However reducing the number of pharmacists who are involved, may also inadvertently reduce the level of clinical pharmacy review of the medications ordered, a checking process which happens routinely in manual packing of DAAs.

The packing efficiency was also emphasised in terms of the importance of business continuity planning, for when (not if) the unexpected happens.

1.8. Compounding robots: the Peter MacCallum Cancer Centre experience

Senthil Lingaratnam, Director of Pharmacy, Peter MacCallum Cancer Centre, Parkville, Vic. described the experience at Peter MacCallum Cancer Centre with their compounding robot which included that:

- the gravimetric method provides quality-assurance checks to confirm accuracy of volume;

- it is resource sparing if a staff member is not required for independent verification;
- there are Work Health & Safety benefits for staff as the compounding robot bears the brunt for difficult-to-compound admixtures and minimises the chances of repetitive strain injury; and
- 10% of the output of the chemotherapy suite at Peter Mac is produced by the compounding robot, with the robot undertaking manipulations for five of the more complex products.

Senthil's key take home messages included:

- although technology is still developing, building local experience is important;
- the technology of compounding robotics provides an excellent career developmental opportunity for pharmacy technicians; and
- the selection of staff appropriate for this activity is important.

2. Experiences with pharmacy automation in Australian hospitals

The afternoon session of the Symposium focused on the process for making good decisions about automation and implementing decisions effectively. This included presentations on:

- identifying if there is a problem in regard to medication management and if so, identifying if automation is part of the solution for solving the problem;
- communicating the need and the value of automation to hospital executive and pharmacy staff;
- writing the business case for automation;
- understanding the need, describing the solution that is required, conducting a tender, and selecting the most appropriate automation to meet the need; and
- implementing the solution and managing the contract and the on-going business relationship with the vendor.

2.1. Identify the problem in regard to medication management and if automation is part of the solution

Andrew Stewart, Director, BPI - Business Performance Improvement, Ringwood, Vic. and *PharmConsult* associate, shared his views based on a lifetime's experience in logistics and automation and hospital redesign to discuss how to determine if and which automated systems is right for a hospital. Andrew discussed:

- the basics for the pharmacy supply system relate to the flow of demand information and pharmaceutical products;
- the key elements and requirements for good pharmacy inventory management practice;
- the factors which impact on the efficiency of product handling;
- the ways to achieve real time inventory control and accuracy;
- the importance of fully integrated information systems with real time transaction management;
- how most pharmacy products can be incorporated into automated storage and picking systems that either enable controlled access or stock to be delivered for picking;
- methods by which automation provides real time control and security access;
- the role that tube systems can play in the delivery of documentation and product;
- the importance of assessment and selection of the right and most effective level of automation being driven by pharmacy and hospital objectives; and
- investment considerations and benefits of automation.

In summary, Andrew posed a number of questions as his take home messages. These included:

- Are pharmacy workplaces organised and efficient?
- Is the inventory management system providing the right information to manage more efficiently?

- Are there clear inventory and performance measures and targets?
- How do you compare to best practice and should you investigate automation alternatives?

2.2. Communicate the need and the value of automation to hospital executive and pharmacy staff

David Kennedy, an independent communications consultant described the planning steps he'd recommend in effectively communicating with two critical stakeholders: hospital executive and pharmacy staff when presenting the case for automation. These steps included:

- think about your audience - each of your two critical stakeholders will have very different drivers and motivators relating to automation;
- set an objective - what do you realistically want to happen as a result of your communication?
- develop a structure - a beginning a middle and an end. Start with the beginning, determine the end and develop the key milestones that will get you there;
- populate with persuasive language - turn the features into benefits and provide evidence?
- consider which visual aids might help - ask yourself 'what is the point I am trying to make and will a visual aid make it more effective?'
- read through - challenge yourself as to the content, put yourself in the mind of your audience. Will they understand, will they believe you?
- dress rehearsal - do so until you are comfortable. It will be different every time and it should be; and
- present - remember you are not presenting to a group of people, you are presenting to individuals. Treat them as such, have a conversation with each of them.

He also discussed the fact that, for your staff in particular, the move to automation will mean change to current procedures and change necessarily begets stress. Whether that stress be negative or positive can be influenced by your communication. That is, negative stress brings cynicism, anxiety and push back. Stress managed well however, can be positive and result in buy-in, productivity and teamwork. He also described typical reactions to change in that people can or will:

- think first about what they need to give up;
- be at different levels of readiness;
- often feel alone;
- only handle so much change;
- feel there are not enough resources; and
- revert back when they can.

And in summary, David suggested that these two key but different stakeholders may consider automation from different perspectives namely:

- the executive: how will it make us better...ROI?
- pharmacy staff: how will I be better off...why should I change?

2.3. Write the business case for automation

Peter Bennett, the National Information and Communications Technology (ICT) Applications Implementation Manager Little Company of Mary Health Care, Calvary presented his thoughts and those of Judith Day (Director, Private Hospitals, Little Company of Mary Health Care, Calvary) on preparing a business case for automated systems. He posed and answered a number of questions and also discussed: what is a business case and what is its purpose, at what point is a business case written, what needs to happen before a business case is written, the challenge of data, elements of a business case, why should we invest in automation, some confusing parts, options analysis, proposal scope, delivery strategy, financial analysis, clinical risk analysis, project governance, and detailed risk management strategy.

Peter's take home messages included:

- know your stakeholders and how to engage them: healthcare has numerous stakeholders and it is critical to involve them despite it sometimes being excruciatingly painful to do this!
- invest more in the front end preparation phase – it pays off in the end;
- health care is nervous and more reluctant about investment in automation and technology - so take it slowly at first and let the initiative prove itself; and
- don't be discouraged: there will be set backs; there will be 'non believers'; and there will be staff who are anti-change no matter what the initiative.

2.4. Understand the need, describe the solution required, conduct a tender, and select the most appropriate automation to meet the need

Rosina Guastella, Senior Consultant, PharmConsult Pty Ltd shared her experience in tender and selection processes and how this methodology can be effectively applied to making sound decisions on solutions involving automation.

Rosie outlined a six step process to achieve this outcome:

- undertake a needs analysis - a key aspect of the process in order to answer questions such as:
 - What do we want to achieve?
 - What are the problems we are trying to solve?
 - Where are these problems occurring?
 - What are our future needs?
- undertake a market scan to increase understanding of the products available;
- conduct an Expression of Interest requesting vendors to describe how they can solve the identified problem(s);
- develop specification based on requirements and objectives;
- release a request for tender; and
- evaluate the tender responses against 'must haves' and be critical of the value of 'nice to haves'.

2.5. Implement the solution and manage the on-going business relationship with the vendor – the Barwon Health Pharmacy Department experience

Dr Greg Weeks, Director of Pharmacy, Barwon Health, Geelong, Vic. described some of the key learnings at Barwon Health from the introduction of their random (chaotic) original pack pharmacy-based robot as:

- implementation is complicated if you are also conducting 'business as usual', and ideally, implementation should occur outside of business hours;
- adequately resourcing the pharmacy implementation team is required;
- there is a significant shift in mind set needed in order to 'trust' the robot, as the stock holdings are no longer visible;
- managing changes in GTINs are challenging, are an on-going process and resource needs to be allocated to this task;
- implementation will take much longer than you think (especially adjusting stock levels)!
- there are a number of issues that need to be carefully managed with the automation of the input and put away of stock function with a robotic system including:
 - some packages and shapes, weights can be rejected by the picking head;
 - bottles need to be entered manually;
 - packaging with dual GTIN will be rejected;
 - packaging with a weak flap can be opened by the picking head; and

- staff confidence to solve any problems with the robot is critical (i.e. not just a chosen few).

Greg identified a number of key success factors including:

- the need for executive support for the business case;
- Pharmacy staff embracing the vision;
- managing expectations; and
- a responsive and caring vendor.

Andrew Stewart (Director, BPI, and *PharmConsult* associate) also spoke from his firsthand experience in implementing automated systems and managing the on-going relationship with vendors. Among the things Andrew discussed were that it takes more than equipment to successfully implement automation, and that it's important to understand the elements of the system and its implementation. These includes:

- the initial cost of the system elements compared with the likely influence of elements on the system's success;
- understanding and attending to the things that matter; and
- starting the right way;

2.6. Panel discussion

The symposium concluded with a panel comprising Anna McClure, Lynette Loy, Amanda Footit, Maryanne Molenaar, Senthil Lingaratnam, and Greg Weeks, who provided an opportunity for delegates to tap into the extensive experience of these and other presenters through a series of questions, answers and discussion.

2.7. Close

Michael Ryan closed the Symposium by thanking attendees for their enthusiastic participation, the presenters who so willingly shared their experience and opinions, the Symposium supporters SHPA, BD and Meditec for sharing the same belief in the Symposium as *PharmConsult*, and the *PharmConsult* staff who worked hard to bring the Symposium to fruition.

PharmConsult Pty Ltd

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