Telehealth Enabled Medicines Management for Care Home Residents

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Fadya Al-Hamadani, Cardiff School of Pharmacy & Pharmaceutical Sciences, Cardiff University
Joanne Kember, Consultant Research Pharmacist
Dr Delyth H James, Cardiff School of Pharmacy & Pharmaceutical Sciences, Cardiff University
Dr Efi Mantzourani, Cardiff School of Pharmacy & Pharmaceutical Sciences, Cardiff University
Dr Mathew W. Smith, Cardiff School of Pharmacy & Pharmaceutical Sciences, Cardiff University

1 Executive Summary

The management of medicines in care homes is notoriously difficult with significant challenges associated with safety, quality and accountability in medicines administration and record keeping. The traditional approach to meeting this challenge has been the implementation of a range of local policies, procedures and protocols combined with enhanced training but nevertheless challenges remain. Moreover, care homes have recently been subject to growing public scrutiny of the care they provide with a particular focus on medication fuelled by a number of reports and safety concerns from academia, safety agencies and the media. Many of these reports, have concluded that increased use of pharmacist skills in the care home environment would result in better outcomes in medicines management.

It was against this background that Beacon Digital Health and its NHS sponsor Abertawe Bro Morgannwg University Health Board (ABMU) were awarded a grant through the Welsh Technology and Telehealth Fund (HTTF) to implement and evaluate a digital medicines management solution for care homes in South Wales.

The digital medication management solution chosen for this project is developed by Invatech Health. The solution is unique in that it links the care home and the pharmacy producing a closed loop system. The system consists of a care home medicines management system called the Pro-active Care System (PCS), a web portal that displays health records called Invalife, and a pharmacy dispensing system called Consolidated Applications for Pharmacy Administration (CAPA); data is shared across the applications giving users access to a complete medicines record for any individual patient.

The School of Pharmacy and Pharmaceutical Sciences at Cardiff University, a partner on the grant, evaluated the digital solution in care homes. This document reports on the evaluation of the system focusing on the following areas:

- Improvements in Quality and Safety through analysis of patient medication administration records (MAR) pre- and post- implementation of the system as well as interventions made by the pharmacists and the system.
- Reduction in waste associated with medicines through analysis of medicines returned from care homes and stock levels held in the care homes pre- and post-implementation
- Usability of the system through surveys of care home personnel and pharmacists pre- and post- implementation.

The base line evaluation (pre-implementation) of paper MAR charts identified 23 distinct error types that could be characterised by four categories relating to medicines administration, regulatory requirements, stock control and other risks. The overall error rate per resident per week ranged from 24 to 48, the error rate relating directly to administration of medicines to patients ranged from 4 to 13 errors per resident per week. Although the absolute number of errors identified is significant, none of the individual errors reported were deemed to result in immediate patient harm although the cumulative impact of such errors on patient outcomes was beyond the scope of this project.

Post-implementation the system had eradicated 21 out of the 23 types of error. The remaining errors were (i) “no administration recorded” (where the medicine was either administered and not recorded OR the administration was omitted altogether), this error type was significantly reduced by at least 88% and (ii) “as directed” dosage instructions which is an issue directly related to the prescribing instructions for the medicine and which cannot be influenced by the system or care home staff.

Post-implementation the system had made a number of interventions that prevented further potential administration errors, a unique feature of the electronic system that cannot be replicated by the traditional paper based Medicines Administration Record system. These included attempts to administer medicines to the wrong resident, attempts to administer the medicine too early or when it had already been administered and for paracetamol containing products an insufficient gap (less than 4 hours) between doses being given or attempts to administer another paracetamol containing product. On average the PCS system made 8.7 interventions per resident per month.

Unlike paper based systems, the electronic system enabled pharmacists to intervene in a proactive and consistent manner to support the care homes in ensuring medicines administration were safe and effective for the patients, that administration records were correct and to flag new medicines or new dosages. Overall the pharmacists made interventions on 80% of prescriptions for the care homes that they supply. Half of the prescriptions required an advanced dispensing accuracy check. On 20% of the prescriptions the pharmacists made clinical checks on new medicines or dosages on prescriptions that did not match the records at the care home. On 10% of the prescriptions the clinical interventions related to drug-drug interactions or the need to stop an existing medicine on the care home’s administration records.

The evaluation also highlighted issues around medicines waste in care homes. Like all studies of waste, this is a complex multifactorial issue and is subject to limitations in the data analysis. Prior to the implementation of the system the waste associated with returned medicines was estimated to be £19.01 per resident per month and over stock of medicines in the care home was estimated at £20.25 per resident per month. Extrapolating these figures across the 26,000 care home beds in Wales, we would estimate the cost of waste medicines to range from £6 million to £12 million per annum.

Whilst the waste functionality of the system is yet to be fully embedded, the available figures for the month following implementation displayed a trend towards a reduction in medicines returned and overstocked. These figures were reduced to £8.54 for returned medicines and £15.73 for over stock, representing a reduction of 55% and 22%. Based on these findings, it can be estimated that for the 26000 care home beds in Wales, there is a potential annual saving of between £3.2 million to £4.6 million.

The survey of views of care home personnel and pharmacists showed that the system is straightforward to implement in the majority of settings and many of the issues reported during the initial implementation phase have been or are being addressed. Of the thirteen care homes surveyed, twelve wanted to continue with the electronic system and would not wish to return to the paper based system.

The pharmacies involved in this initial deployment of the Beacon system recognised the advantages of the system in terms of improved efficiency and the avoidance of 'repackaging' medicines. From the perspective of care homes there were demonstrable improvements in safety. It is worth noting that as the project gained momentum the equipment and processes supporting the system improved from experience.

The system could be developed further from a Pharmacy perspective particularly with respect to training given the process of medicines management that the system uses is distinctly different from established routines and this proved problematic in some pharmacies and care homes. In some cases this was due to inflexibility in others particularly in the early phases of the project due to some "rough edges" that were addressed. Similarly, the process of inputting prescriptions into the system has scope for development. In particular the 2-D scanning introduced in Wales to input prescriptions on to the Patient Medication Record (PMR) does not presently support the Beacon PCS system. The present scanning process captures the image of the script but the Pharmacist has to manually enter the prescription for dispensing introducing further work for the Pharmacy. There is also an issue of endorsement of prescriptions because of the lack of communication between PMR and PCS. All these points are capable of resolution.

In summary, the baseline data (pre-implementation) revealed that there there are significant risks in the medicines management process in care homes combined with a considerable waste of resources relating to unused medicines. Many of the risks are reduced by implementing the system and by enabling pharmacists to make pro-active and consistent interventions. The potential savings through reduction in waste medicines is in the order of £millions. The evaluation has shown that the usability of the system is good and is readily accepted by the pharmacists and the care homes.

The Beacon technology as demonstrated can bring a combination of demonstrable improvements in systems which are likely to have a positive effect on patient safety as well as improvements in efficiency and therefore the case for standardising the management of care home medicines using system(s) that can demonstrate the qualities of the Beacon PCS would reflect innovation delivering prudent healthcare for Wales. The deficiencies of the system identified could be easily addressed were such an approach adopted.

One area we were unable to explore but which clearly the system can deliver is the monitoring of prescribing patterns in care homes. There is public and professional concern over the use of certain classes of medicines such as antipsychotic agents and antibiotics and the system has the potential to report on health board patterns comparing home to home and board to board at scale.

From an academic and professional perspective the project has shown a path for the role of the Pharmacist to develop a new level of engagement in care and through the data develop greater insight into medicines use in the care of the frail.