

1 Executive Summary

The primary aim of this phase of the project was to develop and test a system for the electronic recording, collation and management of medication incidents in community pharmacies.

An electronic communications system (Pharmacy Recording of Medication Incidents and Services or PROMISe) which interfaces seamlessly with two dispensing systems (Rex and WiniFRED) and sends encrypted, HL7 compliant messages to a secure server was developed. The information at the server was de-identified but can be interrogated by users with different levels of access to provide reports at pharmacist, pharmacy, State and National level concerning any aspect of the information available.

The system was pilot tested in seven pharmacies in Tasmania to evaluate its functionality and initial user acceptance, and to provide some preliminary data for examination. 513 interventions were documented over 2 weeks in pharmacies that dispensed 9012 prescriptions for 6077 patients over that time. Interventions were documented at an overall rate of approximately 5.7 every 100 prescriptions, or 8.4 for every 100 patients. Higher rates of interventions were noted for original prescriptions, patients with more than one prescription item, and pharmacies where a PROMISe observer was present. Preliminary analysis of 352 non brand substitution interventions indicated that there was a significant saving in terms of hospital admissions avoided (~\$14,000) and general practitioner visits avoided (~\$700).

At all stages in the development of the technical and clinical aspects of the project, consideration was given to the potential for the techniques to be used in a national system. Thus, in addition to fulfilling the primary aim, a number of unique techniques and tools were developed that are applicable to a larger scale study.

Further, examination of the preliminary data has identified a number of significant opportunities for the information that would be gained from a larger study. In particular, factors which may result in, or be associated with, an increase in intervention rate could be examined, as these would be associated with an increase in potential benefits.

New Techniques and Research/Assessment Tools

D.O.C.U.M.E.N.T. Classification System

The D.O.C.U.M.E.N.T. intervention classification system has been applied to almost 1000 community pharmacy interventions. The system covers aspects of the interventions type, the actions taken by the pharmacist, the recommendations made to resolve the issue, the clinical significance of the event and whether the recommendation was accepted. The system has been validated by over 150 pharmacists from various practice backgrounds throughout Australia. The system's architecture is sound and flexible, allowing for addition or modification of subtypes or new actions or recommendations, or collapsing of subtypes for simplification. This unique categorisation system allows for assessment of these aspects of the intervention in relation to each other (e.g. significance by type or recommendation made) or in relation to the other information collected regarding the event (e.g. significance by pharmacist demographics, drugs involved, type of prescription).

Web Based Categorisation Training and Validation

Pharmacists can undertake preliminary training in the use of the categorisation system from an internet connection. This allows for a reduction in face-to-face training time as well as providing ongoing information to validate the useability and appropriateness of the classification system. Individual feedback was provided to each pharmacist validating the categorisation system.

Identification of Proactive and Reactive Interventions

It appears the intervention rate is increased by increasing the proportion of interventions that are proactive interventions (those that are initiated by the pharmacist). In the pilot study, this was partially explored, but the enhanced training provided in the form of an observer seemed to increase proactive intervention numbers. Other factors that could influence proactive intervention rate should be explored in future studies with a view to providing increased support for those factors that increase intervention rate. It is proposed that education, assistance with training, reduced workload and payment will influence the rate of proactive interventions.

Use of Observer / Support in Pharmacies

The observation technique described in the pilot study report resulted in a significant increase in proportion of proactive interventions in pharmacies when observers were present. These interventions were more likely to be of higher significance and were therefore more likely to be of economic or health benefit than reactive interventions. Further exploration of factors that can increase the frequency of proactive interventions would enable a strong case to be built for developing aspects of education and training to increase proactive intervention rates.

Dispensing Interface and Repository Communications

The communications modules and messaging formats that have been used are efficient (functional even with dial up connection speeds) and compliant with National e health standards. This means that they are easily expandable to a larger number of pharmacies.

Clinical Review Panel Polling Method

The clinical review methodology trialled enabled a unique approach. Each panel member was asked to assign a probability of an event of a particular level of clinical significance occurring. The technique is expandable, and multiple judges could be used to determine a variation around the probability estimate. Using the variation, a probabilistic sensitivity analysis can be undertaken which will establish the confidence intervals for the true estimate of clinical significance. The technique was based on technology that used an internet database to collate input from several judges. The potential for the system to utilise clinical expertise of judges from an internet connection allows for wide-ranging input.

Potential Uses of the Information

Link to Pharmacist/Pharmacy Prescription Data

By collecting information concerning prescription information and using links to the intervention database, relationships between prescription characteristics and the intervention characteristics can be explored for those interventions that are related to a prescription. Common drug groups that were involved in the more significant interventions were respiratory drugs, antithrombotic agents, analgesics and antidepressants. Interventions were over four times more frequent with original prescriptions than with repeat prescriptions.

The collection of this data allows for interrogation of interventions and this can be related to particular drugs or drug groups. A larger sample size could lead to developing a greater understanding of the prevalence of particular drug issues. Also there would be the potential to monitor the impact of educational strategies on pharmacists practice.

Evaluation of Pharmacy Characteristics and Business Style

Preliminary work has been undertaken in this project to establish pharmacy and pharmacist business types and styles. This has the potential to assist in the development of specific change management and motivational techniques for the implementation of new technologies. By exploring the relationship between particular pharmacist/pharmacy characteristics and utilisation of the system, it may be possible to establish a predictive model for uptake and explore response to different motivational factors. These techniques, once refined, would enhance the success of a broad scale implementation of this or other new technologies or practice changes.

Factors Influencing Frequency and Type of Interventions

The methods used in the pilot study allowed for the collection of a wide range of data concerning the pharmacist, the pharmacy, the prescriptions, the workload and the various aspects of the intervention. Given the sample size in the pilot study, these have not been explored. However, there is the capacity to examine relationships between these aspects and the overall intervention rate or nature. It may be possible to determine particular characteristics that are associated with interventions that are more significant (e.g. prior clinical experience, accreditation for medication reviews, lower workload), and these characteristics would form the basis for further education and training.

Professional Development/Educational Aspects

The reporting module on the PROMISe server enables detailed reports of intervention activity to be explored. The potential exists to enable pharmacists to have access to their own intervention reports, thereby providing an indicator of their professional activities. A form of regular feedback of intervention information to individual pharmacists could again be used to enhance involvement and uptake of the system.

Identification of common issues and current trends in interventions with respect to particular types, drugs, or recommendations would enable regular feedback to pharmacists. This information would also provide targets for educational strategies to modify rates of intervention, and the PROMISe ongoing data could be used to monitor the impact of any such strategies.

Conclusions

The main objective of this project was to develop an electronic recording system that enables the collection of data from community pharmacies regarding medication incidents.

Testing of the documentation system and research techniques in a larger group of pharmacies would allow more detailed examination of the factors that increase intervention rates and provide an estimate of the potential economic and health benefits of these activities.

2 Summary of Major Project Outcomes

Major Outcomes		Description/Comments	Core Deliverable Or Value Added
1	Development and validation of an intervention classification system suitable for use in a community pharmacy setting	Feedback received from stakeholders and reference groups. Novel web based validation methodology successfully utilized to achieve wide input.	Core deliverable and value added component in the web-based validation methodology.
2	Engagement of dispensing software vendors Phoenix Corp and PCA NU Systems and full integration of the DOCUMENT classification system into vendors software	Initial work carried out with Phoenix Corp. product REX. Iterative refinement of the intervention recording interface prior to final deployment in and feedback from community pharmacies.	Core deliverable
3	Development and deployment of an ICT infrastructure to permit secure and robust transfer of intervention records to a central data repository.	ICT structure based on the MediConnect and HealthConnect models to permit future integration. HL7 used to transmit clinical fields when appropriate standards have been defined.	Core deliverable
4	Implement pilot studies to confirm capacity to transfer intervention records from community pharmacy sites to the data repository.	Communication capability confirmed with REX and WiniFRED. Use of observers in the pilot rollout proved a highly successful engagement model. High quality training materials and programs developed to assist pharmacists in using the intervention recording software and understanding the use of the DOCUMENT classification system.	Core deliverable with value added component in terms of generation of comprehensive implementation materials and establishing a role for observers in the engagement of community pharmacy owners

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5	Development of a Web Reporting Interface which allows easy access to a variety of reports generated from the 'live' intervention database.	This was seen as a useful tool for providing feedback to community pharmacies participating in future trials as well as allowing authorised parties immediate access to current data.	Value added project outcome
6	Development of techniques for data analysis of economic benefits.	Techniques for exploration of relationships between intervention characteristics and various aspects of pharmacy, pharmacist and workload have been developed and tested on over 500 interventions.	Value added project outcome
7	Development of the web based 'polling tool'.	Assists clinical panel in Delphi analysis of recorded intervention events to ascertain probable health economic value. Could also be used to run an interactive clinical panel with off-site panel members.	Value added project outcome

Table 2-1: Summary of Major Project Outcomes