PROMISe
Phase Two

Final Report to the Pharmacy Guild of Australia
(RFT 2003-2, Evaluation of Clinical Interventions in Community Pharmacies)

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Executive Summary

Purpose. At present, the documentation of cognitive services and medication incidents in community pharmacy practice in Australia is virtually non-existent, yet quality care cannot be provided without complete documentation. Also, there can only be acceptance of the pharmacists' role if the profession has documented evidence of its activities and their outcomes. The Project Team has recently developed and trialled an innovative documentation system for medication incidents and pharmacists' professional interventions and an electronic communications system (Pharmacy Recording of Medication Incidents and Services Electronically or PROMISe) that interfaces seamlessly with two pharmacy dispensing systems, Rex and WiniFRED, and sends encrypted, HL7-compliant messages to a secure server for collation and analysis. This next phase of the research encompassed (i) further refinement of the electronic documentation and communications system and (ii) its implementation to obtain a large sample of clinical interventions from community pharmacies in Melbourne, which could then be subject to comprehensive clinical and economic analyses. In addition, the randomised controlled study design simultaneously enabled the determination of the impact of remuneration and an electronic educational alert on the frequency of pharmacists' interventions. The Project Team also statistically examined issues such as the relationships between dispensing volume and rates of pharmacy interventions, and number of pharmacists normally working and the rates of pharmacy interventions.

Methods. Fifty-two community pharmacies in Melbourne, using the WiniFRED dispensing system, participated in the study. Based on a number of parameters, including location and annual turnover, these pharmacies seemed broadly representative of Victorian and national pharmacies. Full training, onsite and online support, and remuneration were provided for the participating pharmacists. During the phases of data collection, between 21st April to 17th June 2005, pharmacies were randomised to receive payment for clinical interventions ($15 for each intervention submitted electronically) and randomly allocated (on a 3:2 ratio basis) to receive the electronic educational intervention prompt. The prompt was developed to test the hypothesis that a computer-based reminder could increase intervention rates associated with a particular type of intervention. The educational alert related to the use of low-dose aspirin (or other antiplatelet agent) for cardiovascular and cerebral vascular event prevention in high-risk diabetic patients. The alert was automatically triggered when any oral antidiabetic agent was selected for dispensing.

The Project Team developed a unique web-based clinical assessment method which takes into account the probability of a consequence occurring (with the intervention and also without the intervention), the likely outcomes from the drug-related problem and their potential severity, and also the "attributability" of the intervention to the pharmacist (i.e. the likelihood that no other health professional would have detected and resolved the drug-related problem). Four clinical panels, each containing medical practitioners and pharmacists, independently reviewed a total of 291 interventions from the dataset. A comprehensive economic analysis was performed to estimate:

- the economic value to the pharmacy of the pharmacists' intervention (essentially the opportunity cost of the pharmacists' time),
- the economic value to the health care system of the clinical interventions, and
- the economic value of changing the rate of clinical interventions.

The economic evaluation was primarily conducted from the perspective of the health care payer. Included were costs associated with additional time spent by pharmacists, communication costs associated with contacting health professionals or patients/carers etc., costs of hospitalisation, and general practitioner and specialist consultations. The evaluation was intentionally conservative in its approach, and if the reader of the report has access to the electronic version of the report and the spread sheet model, they can easily change the assumptions within the spread sheet.

Results. Overall, there were 2,396 clinical interventions recorded during the PROMISe study. During this period, 435,520 prescriptions were dispensed (a rate of approximately 0.55 clinical interventions per 100 prescriptions or approximately one intervention for every 200 prescriptions) for 258,979 patients (an intervention rate of 0.92 interventions per 100 patients). There were, however, a number of pharmacies whose intervention rates were significantly higher than this (range 0 to 6.99 clinical interventions per 100 prescriptions).

Despite a range of information technology issues, the software was reasonably well received and those pharmacists who used it regularly rapidly became proficient at recording interventions. Half of the pharmacists were able to record their interventions in 1 minute or less during the third week of the trial (approximately twice as fast as earlier in the trial). The presence of the educational intervention prompt and remuneration were each associated with significantly higher rates of recorded clinical interventions in the early phase of the study. The daily rates of recorded clinical interventions, however, gradually declined as the study continued.

Eighty percent of the interventions were considered to be proactive i.e. were initiated by the pharmacist and were not necessary to be undertaken in order to dispense the medication. The majority of clinical interventions were one of three categories: drug selection problems (22.7%), dosage problems (19.4%) or education or information problems (17.4%). Drug groups commonly associated with clinical interventions were antibiotics, drugs for diabetes, cardiovascular drugs and drugs for respiratory disorders. Almost one-third of the clinical interventions were classified as either of moderate or severe level of clinical significance by the recording pharmacist. In almost 90% of cases, the pharmacist investigated the drug-related problem by discussing the issue with the patient or the carer. In one-third of cases, the pharmacist contacted the prescriber in order to clarify the problem. Multiple actions were frequent, and the average number of actions per intervention was 1.87. Over 80% of the recommendations made by the pharmacists were indicated as being accepted.

Without the action of the pharmacist, in an average of 72% of cases there would have been no other health professional who would have performed the intervention. The economic value of the consequences of the pharmacist intervention was reduced to account for this. The clinical and economic analysis suggests that the value of Australian community pharmacist interventions related to prescription medication, in terms of financial costs to the health system prevented, is in the order of $436M each year, or $22 per capita. In addition, around 363,000 hospital bed-days are avoided (1.8 days per 1000 population) and 65.3M days of adverse health impact are avoided (3.27 days per capita) per annum. Our estimate is that 0.7 hours of a pharmacist's time is spent undertaking 6.9 interventions for every 1000 prescriptions (extrapolates to 166,000 hours undertaking 1.734M interventions nationally each year). For every hour a pharmacist works, their interventions prevent $20 in medical and hospital costs, and for every 100 hours worked, their interventions prevent 2 days in hospital. As a result of each clinical intervention by a pharmacist, there is a mean reduction of 0.22 days spent in hospital and $283 in total costs. Based on the most conservative estimates during sensitivity analyses, the current value of community pharmacists' interventions related to prescription medications in Australia is at least $228M in costs prevented, 184,000 days in hospital prevented, and 35.9M days of adverse health impact prevented per annum. On the other hand, the additional value of increasing pharmacists' intervention rates to those achieved in many of the pharmacies in the PROMISe project is $857M in medical and

hospital costs, 1.05M hospital days avoided, and 118.6M days of adverse health impact avoided per annum.

Our results also indicate that pharmacists may identify and act upon only a third to a half of all possible opportunities for clinical intervention, and that the costs of these omissions is likely to be greater than the benefits of the current rate of intervention.

Conclusions. The current value of Australian community pharmacists' interventions in both health and financial terms is high. However, there is considerable scope for increasing this impact; it is likely that both the existing rate and the financial value of pharmacists' interventions could be increased three-fold. As demonstrated here, automated educational alerts within computerised dispensing systems possess significant potential for continuing professional education and increasing pharmacists' intervention rates, and thereby improving the quality use of medicines. Other methods that may increase the rate of intervention and are worthy of examination in more detail include reducing pharmacist workloads (increasing staff levels); introducing payments for meeting selected intervention targets; and practice-based payments for improved intervention rates.