

Innovation in Aged Care

The introduction of electronic medication charts and prescribing in aged care facilities: An evaluation

Pippa Burns, David A Perkins and Karen Larsen

Centre for Equity and Primary Health Research in the Illawarra and Shoalhaven (CEPHRIS), Centres for Primary Health Care and Equity, Faculty of Medicine, University of New South Wales, Wollongong DC, New South Wales, Australia

Andrew Dalley

Illawarra Division of General Practice, Wollongong DC, New South Wales, Australia

The objective was to test the feasibility of electronic medication charts in aged care facilities and the impact on general practitioner (GP) and staff work processes.

The Illawarra Division of General Practice conducted a trial where GPs used a modified version of commercially available software to generate medication charts, in four residential aged care facilities. Semistructured, face-to-face interviews, log books and an issue register were used to evaluate the success of this trial.

The system improved chart clarity, which was felt to have improved medication management accuracy. However, system usability was hindered by the location of the computer, the availability of prescription paper, and technical difficulties. The system is inexpensive and three facilities have continued to use it after the trial period.

To show measurable improvements in medication management, a trial that includes all residents is needed.

Aged care facilities need more computer equipment in order to adopt important innovations.

Key words: *computerised, computing methodologies, drug, family physicians, homes for the aged, medical record systems, prescriptions.*

Introduction

Medication management in aged care facilities is often complicated by polypharmacy, excessive use of tranquillisers and psychotropic agents, lack of medication review and administration of medication by untrained or unqualified staff [1].

It is estimated that 2–5% of handwritten medication charts and prescriptions contain errors [2]. Furthermore, a large number of community dispensing incidents reported were attributed to misinterpreting the prescription [2]. Runciman

et al. [3] attributes up to 30% of hospital admissions in patients aged 75 years and over, in Australia, to adverse drug events and medication errors and it is thought that up to three-quarters of these events may be preventable [3].

Methods

The Illawarra Division of General Practice (IDGP) conducted a trial of computer-generated medication charts for patients of five general practitioners (GPs), located in four residential aged care facilities (RACFs) in the Illawarra. Three were high-care facilities and one housed low-dependency residents.

The trial was implemented in two phases. The first involved installation and use of a computer (equipped with a modified version of PROFILE [4], software that provides both clinical information and practice management capabilities) and a printer in each aged care facility. Training was provided for visiting GPs and facility staff. In phase 1, GPs were able to produce electronic medication charts and prescriptions at the facility (Fig. 1). Phase 2 involved the linking of the computers in the GPs' surgeries to those in the aged care facilities by broadband (ADSL), thus allowing the GPs remote access to patient information and medication charts (Fig. 1).

The Centre for Equity and Primary Health Research in the Illawarra and Shoalhaven (CEPHRIS), University of New South Wales, undertook an independent evaluation of this trial. Mixed methods [5] were used to evaluate the implementation and impact of the system in a triangulated approach.

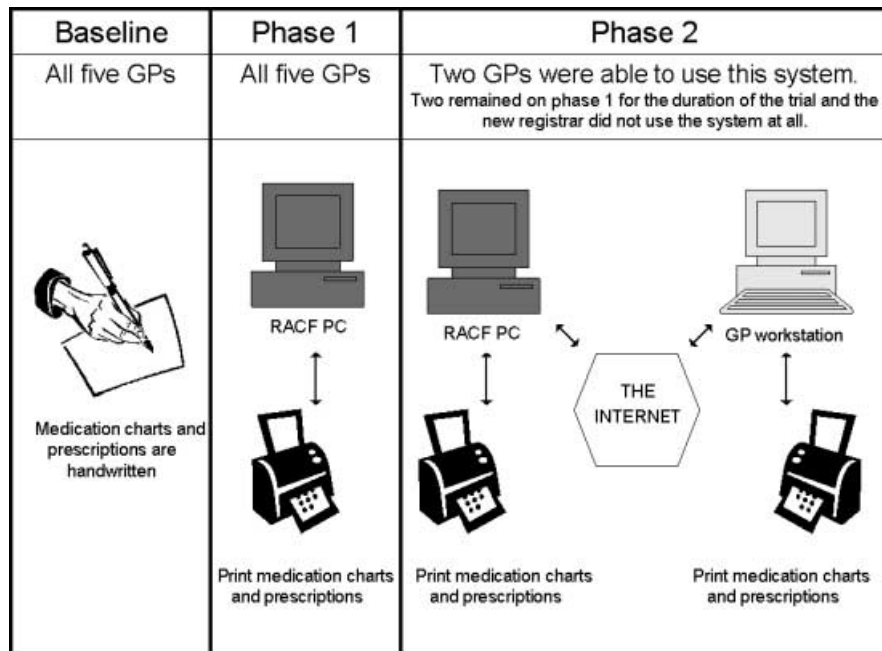
Semistructured, face-to-face interviews were held individually with the stakeholders at the beginning of both phase 1 and phase 2 and also at the conclusion of phase 2. Each interview lasted between 30 minutes to an hour, depending on the respondent. Notes were taken during the interviews. Answers that were unclear were discussed with the interviewees at this time. Interview notes were transcribed as soon as possible after the interview. All interviews were conducted by the same experienced interviewer, ensuring reliability.

Project staff were interviewed at the end of phase 1 and during phase 2. While most of the scheduled questions were open-ended, a number of closed ended questions were included in the final interviews to allow direct comparison of data.

A focus group was also held with participating GPs at the start of phase 2. This was used to validate the results of the individual GP interviews. Log books were given to all stakeholders and an issue register was maintained. Other relevant records

Correspondence to: Dr David A Perkins, Centre for Equity and Primary Health Research in the Illawarra and Shoalhaven (CEPHRIS), Centres for Primary Health Care and Equity, Faculty of Medicine, University of New South Wales. Email: david.perkins@unsw.edu.au

Figure 1: A schematic representation of the trial phases.



RACF, residential aged care facility.

kept by the stakeholders, such as medication chart audits, medication errors and incidents were also reviewed.

The evaluation was approved by the University of New South Wales Human Research Ethics Committee.

Results

By the end of the trial, two doctors were able to access their patients' medication charts remotely. One GP did not progress to phase 2 because his practice did not use PROFILE and one practice could not be connected because of difficulties with the Internet service provider.

RACF perspectives

All stakeholders found that the clarity of the medication charts had improved. All of the participating clinicians felt that this had led to a reduction in medication errors during the trial. Aged care facility staff emphasised that printed charts resulted in quicker, more efficient medication rounds and were of particular benefit to new staff, including agency staff and locum doctors.

At the end of phase 2, all of the participating facilities reported that the frequency of GP visits, the amount of time they spent at the aged care facility, and the time they spent consulting with patients had not been adversely affected by the trial.

GP perceptions

The GPs found that the process of entering each resident's details on to the computer often resulted in an informal review of their medication.

Three GPs reported that the time needed to create electronic medication charts was less than that needed to create handwritten charts. All of the GPs admitted to writing minor changes on the printed charts because they believed it was quicker than editing and printing a new chart. At the end of the trial, only one GP reported spending more time doing paperwork during the trial than previously, which was attributed to ongoing technical issues with the system.

Remote access was felt to be beneficial as it permitted immediate access to records and let multiple users view the same information. Generally, it was found that the new system streamlined existing processes. GPs who formerly kept duplicate patient notes at their surgery ceased doing so once they had remote access to the aged care facility records.

GP use of system components

While all GPs used the system to generate individual patient medication sheets, only one GP used the system to print prescriptions at the aged care facility. Both the need to carry pre-printed practice prescription paper and the physical location of the printer relative to the clinical areas were reported as barriers.

The GPs made minimal use of the decision support function with three doctors using it occasionally to check for adverse drug interactions.

Training

Four of the initial five GPs used PROFILE [4] before the trial began. The fifth GP did not use PROFILE [4] in his practice and made minimal use of the trial system. However, he suggested

that this was because of time constraints, and inaccessibility of the computer rather than lack of familiarity with the software.

All doctors were satisfied that less than 1 hour of training was needed for a GP, using PROFILE [4] in his practice, to become familiar with the trial system. However, it was felt that more training would be necessary for GPs to become experienced in using another practice software program.

Technology problems

Many of the technical problems reported by trial participants concerned the location of the computer, whether it was turned on, ready to use and available. One GP experienced ongoing technical difficulties including printer settings and problems obtaining a password. The other GPs reported difficulties when hardware or software were upgraded and when other users changed computer settings. It should be noted that none of the facilities had on-site staff to deal with IT problems.

The number of programming issues identified were minimal ($n = 8$) and included the length of the resident's last name and whether to use numerals or words to express medication doses.

Costs

The IDGP estimated that it would cost an aged care facility \$AU2493 to set up the system (2005 prices). Ongoing costs were approximately \$AU1468 per annum. This does not include the costs incurred by the Division of General Practice in programming and developing the system.

Sustainability and wider implementation

At the end of the trial, all stakeholders rated the system as either 'very useful' or 'quite useful'. The GPs were keen to continue with the system and were positive about introducing it into other aged care facilities. They also indicated a desire to use the system to maintain patient notes in addition to medication profiles.

Discussion

This trial has shown that the use of a modified GP clinical information and patient management system (PROFILE [4]) in residential aged care facilities can contribute to patient safety by increasing the legibility of medication charts, providing GPs with a mechanism to check for possible adverse drug interactions and verifying patient records remotely when communicating with RACF and hospital staff.

The use of printed medication charts was felt to shorten medication rounds even when only a proportion of patients were included in the trial. This effect would be more pronounced if all residents had printed medication charts. RACF staff reported that the effect on efficiency would have been greater if those GPs whose handwritten charts were most difficult to read had taken part in the trial. They noted that the GPs involved in the trial were those whose handwritten charts had caused fewest problems in the past.

As not all of the residents were taking part in the trial, it was impossible to collect the number of medication errors that applied to the sample in each RACF. It is suggested that a future pilot be conducted that includes all residents and all GPs at interested RACF(s).

The aged care facilities in this trial could be described as late adopters of IT for clinical purposes when compared to other parts of the health industry. In most cases, there were no computers in clinical areas and staff did not use computers in their daily tasks. This is illustrated by the fact that the computer was often located in another part of the building, in a locked room, was being used by someone else or simply turned off. Hider [6] notes that key characteristics of situations where electronic prescribing systems have worked well include: organisations that use fast, reliable systems, where there is easy access to machines (fixed or mobile) in clinical areas, and adequate resources including staff training and information technology backup. This is perhaps the most important problem encountered during the trial and is likely to be a barrier to the swift adoption of clinical information and management systems.

At the outset, a number of aged care facilities anticipated staff stress about computer use and poor computer skills as potential barriers to use. However, these problems did not eventuate, perhaps because of the lack of interaction most staff had with the system.

Over the last decade there has been an increase in the use of computers for clinical purposes in general practice [7,8]. The logical spread of technology to aged care facilities has the potential to attract and retain more GPs by streamlining the paperwork involved including medication chart requirements.

While the GPs experienced a series of frustrations that have been described above, they were strongly supportive of the trial and of its continuation in the facilities they were visiting. The medication chart facility was more attractive to GPs who regularly wrote four or more charts during a visit as the time savings were greater.

The cost of developing the system was minimised through the modification of existing software. The costs for continued use by the facilities were reasonable and the training costs were low for both GPs and for RACF staff.

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Key Points

- The use of electronic medication charts is likely to increase patient safety.
- There is a lack of computer infrastructure in most aged care facilities which will hinder the adoption of important innovations.

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