

Design Challenges for Electronic Medication Administration Record Systems in Residential Aged Care Facilities

A Formative Evaluation

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Keywords

Medication administration, electronic medication administration records, residential aged care facilities, system design, formative evaluation

Summary

Introduction: Electronic medication administration record (eMAR) systems are promoted as a potential intervention to enhance medication safety in residential aged care facilities (RACFs). The purpose of this study was to conduct an in-practice evaluation of an eMAR being piloted in one Australian RACF before its roll out, and to provide recommendations for system improvements.

Methods: A multidisciplinary team conducted direct observations of workflow (n=34 hours) in the RACF site and the community pharmacy. Semi-structured interviews (n=5) with RACF staff and the community pharmacist were conducted to investigate their views of the eMAR system. Data were analysed using a grounded theory approach to identify challenges associated with the design of the eMAR system.

Results: The current eMAR system does not offer an end-to-end solution for medication management. Many steps, including prescribing by doctors and communication with the community pharmacist, are still performed manually using paper charts and fax machines. Five major challenges associated with the design of eMAR system were identified: limited interactivity; inadequate flexibility; problems related to information layout and semantics; the lack of relevant decision support; and system maintenance issues. We suggest recommendations to improve the design of the eMAR system and to optimize existing workflows.

Discussion: Immediate value can be achieved by improving the system interactivity, reducing inconsistencies in data entry design and offering dedicated organisational support to minimise connectivity issues. Longer-term benefits can be achieved by adding decision support features and establishing system interoperability requirements with stakeholder groups (e.g. community pharmacies) prior to system roll out. In-practice evaluations of technologies like eMAR system have great value in identifying design weaknesses which inhibit optimal system use.

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1. Introduction

Medication management is one of the fundamental collaborative processes in residential aged care facilities (RACFs) which require RACF staff, general practitioners (GPs) and community pharmacists to coordinate their activities [1–3]. For medication management, this includes prescribing, ordering, delivering, administering and monitoring. Medication safety is a major challenge for the elderly population in RACFs [2–4]. Gurwitz et al. [2] in a study based on two long-term care facilities in Canada found an adverse drug event rate of 9.8 per 100 resident-months. Almost a third (28%) of the 885 adverse drug events identified in the study were deemed fatal, life threatening, or serious [2].

Medication administration has been identified as the most vulnerable to error in RACFs [4–7]. Medication administration involves the delivery of the right medication and dosage to the right resident at the right time using the right route [8]. Pierson et al. in a US-based study reported that 47% of the 2,731 reported medication errors in 25 nursing homes occurred during administration [9]. The 2007 report by the US Institute of Medicine (IOM), estimated medication administration errors in long term residential care occur at a rate of 6–20 per 100 doses, with drug omissions as the most frequent [6]. A recent study of medication administration errors in 13 care homes in the UK, using a barcode medication administration (BCMA) system reported that 45% of errors (n=2,289) involved attempts to give medication at the wrong time [4].

As is the case in other health care settings, the use of information and communication technology (ICT) in aged care settings has the potential to add value by improving the quality and safety of care [10–14]. However, when compared to acute care settings there is very limited evidence about the use and impact of technological interventions to improve medication safety in RACFs [15,16]. A few studies have explored the use of electronic medication administration records (eMAR) in RACFs. Scott-Cawiezell et al. [17] described use of an eMAR system in five nursing homes in the United States, and reported streamlining of the medication administration process by provision of real-time information, improved legibility and alerts prompting staff of potential medication safety issues. However, the authors identified streamlining of the underlying processes and appropriate adaption of the system to their implementation context as a prerequisite for the realisation of intended benefits [17]. Similar results are suggested by Vogelsmeier et al. in their study which explored the underlying nature of workaround in relation implementation of an electronic medication administration record in five USA nursing homes and identified the potential risks of workarounds on medication safety [18]. The study identified limitations in technological design and failure to reengineer related processes to interface with the eMAR system as the primary causes for adoption of workarounds which may impose risks to residents' medication safety [18].

The success of ICT interventions such as eMAR systems, depend to a large degree on their alignment with the context of implementation [19, 20]. In-practice formative evaluations are a valuable process by which to identify potential system design improvements within their context of use [19,20]. The Australian experience of implementing eMAR systems in RACFs remains largely underreported in the literature [21]. The implementation of an eMAR system in an RACF by one of the largest aged care provider organisation in Australia, with a planned roll-out of the system across remaining sites (n=77) in New South Wales (NSW) and Australian Capital Territory (ACT) presented an opportunity to conduct an in-practice formative evaluation. A formative evaluation was chosen in order to provide feedback to the system vendors to facilitate the optimal implementation of the system at the remaining sites. The aim was to identify limitations of the system and to suggest system improvements prior to the roll out.

2. Materials and Methods

2.1 Research Setting

The study RACF site (78 residents) had been piloting the eMAR system for almost 24 months at the time of study. The community pharmacy, the primary medication supplier for the study RACF site, also participated in the study.

The Clinical and Care Management system, developed by iCareHealth [22], had been implemented across all organisational RACF sites in 2006. The system's primary function is to facilitate electronic documentation and record keeping of residents' clinical documentation such as: care plans, progress notes, assessments (e.g. pain) and the aged care funding instrument (ACFI). The eMAR system was developed by iCareHealth as a module of the existing Clinical and Care Management system. The eMAR system went through a few software and hardware changes (redefinition of user groups and associated access rights, change of tablets) after initial implementation at the pilot site. The organisation had a plan to roll out the eMAR across all the remaining 77 sites by July 2014. However, no formal evaluation of the system had been conducted post its implementation at the pilot site. A formative evaluation was therefore identified as necessary to rectify system limitations prior to the roll out.

2.1.1 Medication charting in the RACF

► Figure 1 presents an overview of how data are entered into the eMAR system. Prescribing continues to be on paper medication charts. The community pharmacy supplies printed copies of medication charts to the RACF. Any changes to residents' medication regime (e.g. adding, ceasing, or modifying medications) are performed by doctors on the paper medication charts. These charts are then faxed by RACF staff with an order cover sheet to the community pharmacy. RACFs can send electronic order messages to the pharmacy using the messaging interface of the eMAR system. However, this does not eliminate the need to fax the complete paper medication chart. It is the responsibility of community pharmacy staff to enter the data from the paper medication chart into the eMAR system and to dispense medications. The community pharmacy has a number of disparate electronic systems which serve different purposes in support of their work processes. These include a dispensing system, a medication packing system and a data entry component of the RACF's eMAR system. An integrated data entry interface allows the pharmacist to simultaneously enter data in all systems. The interface at the pharmacy is password protected. The registered nurse (RN) at the RACF who is also the site manager cross-checks the updated electronic medication profiles provided by the pharmacist with the paper medication charts. In case of discrepancies, the manager communicates the corrections to be made to the community pharmacist over the telephone. If no discrepancies are found, the RN 'approves' the updated medication profile, which then becomes visible on the eMAR system. RACF staff can access these profiles on tablet computers to administer and document during administration rounds. The tablets and computers at the RACF are password protected. The RACF manager and staff need to login for data synchronisation and sending messages to the pharmacy.

2.1.2 Use of the eMAR for medication administration

The eMAR system communicates over the internet to send and receive data but also offers offline the capability to continue with medication administration in situations where there is no internet connection. Once the internet becomes available data needs to be re-synchronised to send and receive the latest changes to residents' medication profiles. As the RACF does not have a wireless internet, staff must synchronise the eMAR system pre and post administration rounds, to access and upload the latest medication profiles. Medication administration rounds at the site were carried out using two tablet computers. The facility is spread across two levels. The tablets are configured to be logged in for clients residing on a specific level. Table 1 summarises the key steps involved in typical medication administration round at the RACF site.

2.2 Data Collection

A qualitative study design was chosen because of its ability to allow a context-rich exploration of the eMAR system. Researchers met with the site manager, RACF staff and the community pharmacist to explain the purpose of the study and invite them to participate in the study. The participants were recruited using purposive sampling methods – based on their involvement in the medication process in the RACFs. The site manager was approached to participate in an initial discussion, given her role in overseeing and reviewing the entire medication management process. Participation was voluntary and participants did not receive any remuneration for their participation.

Data were collected over a six month period (May to October 2013). The three main sources of the data used in this study were:

1. Non-participant field observations; scripted and unscripted follow-up probes were used to elicit further information during observations. The data were collected by three members (two qualified pharmacists and a human factors researcher) of the research team. All members had training and experience in qualitative data collection. We conducted direct observations of the workflow (n=34 hours (3.4 hours per session), over 10 days) at the RACF site and community pharmacy. Two pilot observation sessions were conducted by all three members; their notes were compared and discussed to establish consistency in the data collection process. The observations focused on understanding how the participants (included RACF staff (n=4), RACF manager, and the community pharmacist) use the eMAR system in their daily work and information flows. All the observed RACF staff had appropriate qualification and training (certificate III or above in nursing). Field notes and photographs were the primary form of data collected during observations.
2. Thirty minute semi-structured interviews with the end users of the system (included RACF staff (n=3), RACF manager and the community pharmacist). An interview guide (Appendix I) was developed based on existing literature [9,16,28] and preliminary observations to understand current work practices associated with use of the eMAR system and staff perceptions of challenges associated with the design and operation of the eMAR system. All interviews were recorded and transcribed verbatim by a professional transcribing service and validated by a member of the research team.
3. An analysis of artefacts used in the medication ordering and administration process at the RACFs and the community pharmacy. This also included a review of education materials (user manuals etc.) provided by the system vendor to train the RACF staff.
4. Ethics approval for the study was obtained from Human Research Ethics Committee (HC13091) at University of New South Wales, Sydney, Australia.

2.3 Analysis

We used thematic analysis to derive categories relating to the design challenges associated with the eMAR system [23]. The process was iterative and generated from the ground up using actual data. The grounded analysis approach was employed to analyse the data within a multi-phase process [23]. One of the authors (AT) performed the initial open coding of the data which was reviewed by the research team to identify the need for any restructuring of the coding scheme. Five iterations were made to accomplish the final coding scheme. Electronic management and coding of data using QSR NVivo (v.9) software supported data management and automatic collation of all data extracts within each code. Revision and finalisation of categories was achieved via triangulation and consensus between all researchers [24]. Participants were also provided with a written summary of findings in the form a newsletter and given an opportunity to provide feedback. The findings presented in the next section were shared in detailed presentations to participants and key organisational stakeholders, which included members of the Information Technology Service Centre (ITSC) department, in November 2013. The organisational ITSC team was assigned the responsibility to communicate the required changes to the eMAR system to the vendor before its organisation-wide roll out.

3. Results

The in-depth analysis of the data identified five categories of challenges associated with the design and use of the eMAR system.

3.1 Limited Interactivity

The eMAR messaging interface in the community pharmacy has an alert icon which turns red if there are new or unread messages from a RACF, but remains green if all messages have been read by the pharmacist (►Figure 2). Although this icon alerts the pharmacist that an order message has

been received, the icon is 'read only' and does not navigate the pharmacist to the actual message. The pharmacist has to manually search through all of the RACFs to which they provide a service in order to identify which RACF has sent the message. As explained by the community pharmacist: "It's just an alert. So when there's a red dot, if you've got 20 facilities there you've got to go through and click to see where that red dot's coming from... it's very frustrating and it could just be for a nail polish for [resident X]". The icon also does not establish the urgency of the order, which may result in the pharmacist spending time searching for the order, only to find that a non-urgent order (e.g. request for cosmetics for a resident) has been placed. Similar issues are experienced at the RACF end, the asterisk icon indicating that a resident's medication profile has changed in the last 24 hours does not offer any navigational support to the RACF staff to identify the details of the changes (i.e. which medication has been ceased, added or changed).

3.2 Inadequate Flexibility

At present, the RACF staff including managers can access residents' medication profiles as read only. All changes to these profiles have to be completed by a community pharmacist. As explained by the RACF manager: "When we admit them, they're [residents] in the [EHR system] but they're not in the [eMAR] system. Cause we can't adjust anything on that [eMAR] system. It's all directly pharmacy. We can't take medications off, or add them on" (RACF Site Manager). Medications can only be scheduled to be administered at one of eight pre-defined times (► Figure 3). The community pharmacist described this as problematic for residents where doctors have given clear instructions to administer medications at a specific time: "I've got one lady, she has to get her Tamoxifen for breast cancer, but 3 o'clock is not an allocated dose time. It's 8 o'clock, 12 o'clock, 5 o'clock and 8 o'clock" (Community Pharmacist). To overcome this design limitation, the pharmacist would enter the specific administration time in the 'Full direction' data entry field (► Figure 3). Consequently the medication appeared for the resident in their dinner time (5pm) list, but staff were required to read the directions on the eMAR carefully to note that the medication actually needed to be administered at 8:30 pm.

The system did not allow entry of the correct administration instructions for specific medications like patches. A patch needs to be applied to the resident at the prescribed time (for example, 8am) and then removed from the resident after a certain time (for example after 12 hours at 8pm). The eMAR system has the capacity to only enter one administration time. The pharmacist therefore has to enter one order for a patch twice in the system. The first order is to apply the patch at ON time. The second order is to remove the patch at OFF time (► Figure 4). If the pharmacist does not enter two orders for one patch, it will appear only once in the resident's profile which may result in either a missed application or removal of the patch.

3.3 Issues in Information Layout and Semantics

Several issues with information layout and semantics were identified. Pharmacists need to assign the medication to a category from a predefined drop down list. The options in this list (Antibiotics, Packed, Non-Packed, Short-term, Schedule 8, Schedule 4D) are not mutually exclusive (Figure 5). For example, an antibiotic agent in tablet or capsule formulation can be categorised as an 'Antibiotics'. However, the antibiotic in most cases is a short term treatment and packed in a separate Webster pack from regular medications to indicate to staff that this is a short term treatment. The present system does not allow the pharmacist to assign two categories, for instance both 'Antibiotics' and 'Short Term' to a medication. The assignment of category to medications like antibiotics becomes further complicated if these are prescribed to be administered in liquid form, which therefore cannot be packed in the Webster pack. In such cases antibiotics may be categorised as 'Antibiotic', 'Short-Term' and 'Non-Packed'. As the present system allows assignment of one category to the medication, it is at the discretion of the community pharmacist to decide in which category the antibiotic should be listed. The variability in assignment of categories and associated possible packing type requires staff to see if they have administered medication from all Webster packs for the resident and also carefully cross check the number of non-packed medications to be administered to the resident.

Non-regular medications (eg weekly, fortnightly or monthly) do not have a specific category. To ensure that medications are administered correctly, the pharmacist is required to appropriately uncheck the auto checked boxes to select the days when medication should be administered. A further issue was inconsistencies in information layout across different views of the system. An example of this is the use of dissimilar field titles across different views of the same information (► Figure 6). The pharmacy data entry interface had two fields to specify directions (Direction (short); Full Direction (long)). The full direction appear as “Instruction” in the medication profiles of residents viewable at the RACFs and the same content appeared under the “Frequency” column in the administration profile viewable on the tablets.

Given the variation in medication formulation types available for administration, dosage units will naturally vary. The administration view in the eMAR system currently represents all formulation doses using numbers. For medications in capsule or tablet form this may be adequate, however for non-packed medications such as liquids, puffers or creams the number listed in ‘Dose’ requires further interpretation by staff administering medications. To compensate for this limitation, the frequency column in the administration view (which is labelled “direction” at the pharmacy system end) presents the details of the units (► Figure 6).

3.4 Minimal Decision Support

The eMAR system offered very limited decision support for the RACF staff. Decision support in this context relates to alerts and information that can facilitate staff in their administration decisions (for example decision to administer a PRN (as required medication)). The system has no capacity to offer staff alerts based on vital signs or pain scores documented in the assessment forms and progress notes. The computer tablets are configured only to display residents’ medication profiles and do not offer real-time access to pertinent documentation, for example progress notes. Such clinical information is used by staff to inform their administration decisions as noted during observations: *“The sequence of medication administration is decided by the staff. However it is informed by information like residents’ doctor appointments, PRN requests by residents, residents’ personal preferences etc. There is no automation of these features. It is entirely up to the staff to remember and perform administration by manually taking these factors into account”*(Observation Notes). Stocked medications also need to be managed manually by RACF staff. This may not be a problem for packed medications which are delivered in weekly Webster packs but was observed to be problematic for non-packed medications as staff were observed running out of non-packed medications (e.g. syrups; eye drops) during administration rounds.

3.5 System Maintenance Issues

Delays in data synchronisation, which means updating of the eMAR system records at the RACF with the latest changes made at the community pharmacy, were also identified as an issue. If the synchronisation took too long, RACF staff would assume that the pharmacist had not updated the records and would try to contact the pharmacist to have this rectified when in fact there was nothing to rectify. The pharmacist also identified delays in managing orders due to internet crashing: *“I [community pharmacy] crashed on the internet once and we didn’t realise until they [RACF] rang and said, “Oh the order for Ventolin for [resident X] didn’t come.” So then I rang [eMAR vendor] and they re-booted the [eMAR system]”* (Community Pharmacist).

At the RACF end, the RACF site manager highlighted challenges of coping with system crashing: *“Last Friday night, all toughbooks crashed, which was ok ‘cause we just printed off all the medication charts, so there is a back-up plan. But trying to find somebody to come and fix that was a bit of an issue”*. When the system is down, it is necessary to either print the signing sheets at the RACF or ask the pharmacist to print and courier medication charts (in case the eMAR system is down at RACF) which can be cumbersome and time consuming. As explained by one of the RACF staff members: *“The manager said well, I guess we’re going to have to do it manually, and it’s this thick! (gestures with the hands). Because it’s for every resident, like [for] each single tablet, a [separate] sheet. And you have to sign... Oh, mygod! It’s so time consuming!”* (RACF Staff Member).

4. Discussion

The medication management process in RACFs requires coordination across geographically distributed professional groups and involves activities that are interdependent and inseparable [25–27]. Our study results show that the work practices of both RACF staff and community pharmacists are greatly affected by the implementation of the eMAR system. As the scope of the implemented eMAR system was confined to the medication administration stage, it offered limited capacity to address the information exchange issues (e.g. transcription errors) related to the prescribing and ordering stages of the RACF medication management [28]. Introduction of end to end shared electronic system, with appropriate interoperability, can minimise the risks associated with information double handling and use of hybrid systems. The major design considerations for such systems would need to effectively enable transmission of information between different systems across various settings (GP practices, community pharmacies and RACFs). For aged care settings, these systems need to carefully integrate administrative (e.g. medication stock) and clinical (e.g. residents' allergies) information [25–27]. The electronic transfer of medication charts between community pharmacies and RACFs would substantially streamline the current manual process and reduce the costs associated with the use of fax as the primary exchange mechanism [28].

Our study identified various system design challenges which limit the realisation of the full potential of the eMAR system and may result in unintended technology hazards in both RACFs and community pharmacies, most of which were not anticipated at the time of system implementation [29,30]. Recent studies investigating the impact of electronic prescribing on community pharmacy workflows have identified various design weaknesses which include inadequate interoperability, synchronisation delays, user interface issues and inconsistent formats which negatively impact community pharmacy workflows [31, 32]. Our results concur with several of the design weaknesses identified in these studies and their impact on community pharmacy workflows. The existing eMAR system relies on pharmacists' resilience to prevent and recover from data entry errors. The community pharmacist sometimes had to take additional steps beyond the system to cope with the lack of support provided by the system [33]. Primary examples of these included double data entry for patches, assigning specific administration times for medications, synchronisation issues and coping with inconsistent layouts across disparate systems. Such data entry requirements require additional alertness and a high amount of memorisation (for cross system data entry) therefore increasing pharmacists' cognitive burden and risk of data entry errors [32, 33].

One of the major design challenges identified related to lack of consistency in information layouts and limited considerations of information semantics in the system design. Striving for information consistency in health care settings is not only a problem of technical integration, but also of aligning inter-organisational work processes [34–36]. Achieving the right degree of information consistency therefore requires input from all stakeholders about residents' medication information to negotiate how to stabilise the content and meaning of coordinative artefacts like medication charts [35,37,38]. These decisions on the extent of information standardisation are of fundamental value to the design of technological interventions like eMARs as their primary objective is the exchange of useful information in any format (paper or electronic) across multiple settings.

Results from the study provide immediate as well as long term value to the RACF organisation in optimising the design and use of the eMAR system. Immediate value can be achieved by addressing some of the design challenges, like improving interactivity of the alerts by navigating the user to the required information. Further, reducing inconsistencies in data entry by offering clear guidelines to users for example regarding the categorisation of each drug by medication type (antibiotics, eye drops, creams etc), packing type (packed or non-packed) and its intended administration duration (regular, short-term, pro re nata (PRN), weekly) etc. The results point to the need for a dedicated IT support team and continuous commitment by the organisation in relation to appropriate resourcing for IT infrastructure to minimise connectivity issues [39]. This also includes consideration of enabling wireless internet in the RACFs to improve the synchronisation pre and post medication rounds. However the organisation needs to carefully address the security and privacy risks associated with wireless internet prior to its enablement.

Long term value can be achieved by sharing the results of the evaluation with the vendor in order to address issues identified (e.g. appropriate decision support) in future releases. Findings also in-

crease organisational awareness of how to avoid these challenges in future stages of system implementation and setting priorities prior to the organisation-wide roll out [19,40]. The implementation and use of electronic systems like eMARs, in RACFs are contingent on factors which span multiple stakeholders and organisations and which may not always be evident through the prism of a single stage of medication management [41, 42]. A single RACF organisation with multiple sites receives services from a large number of community pharmacies and GP practices. There are likely to be subtle differences in the technology infrastructures and work processes of individual settings. For instance, in this study, the community pharmacy had three disparate systems, each with its own underlying schema and architecture. Outlining existing systems of the individual settings, identifying associated operational nuances and establishing interoperability requirements is vital for informing the design and maintenance of eMARs for supporting collaborative health care processes [43]. This will facilitate in the establishing well defined goals of these interventions and understand how they evolve during and post-implementation [44, 45].

Finally, it is important to emphasise the potential risks to residents' safety attributed to the flawed eMAR design. For example, the mismatch between the assigned administration time on the system and what appears in the instructions increases the risk of administering medications at wrong time. The synchronisation and system interactivity limitations can lead to delays in receiving orders at the pharmacy, which increases the risk of missed dose errors. The dual entry of patches and variability in categorising medications not only compromises information integrity in RACF systems, but also corrupts pharmacy records (as they are entered through the same data entry interface). This process of duplicate data entries is crucial for RACF residents as the accuracy of their medical records across different settings could be compromised. Studies in both hospitals and aged care settings have identified overcoming design limitations of technological interventions that span multiple healthcare settings as a pre-requisite to achieving their benefits and minimising risks to patient safety [46–49]. Although the primary aim for implementing systems like eMAR in health care settings is to improve medication safety, our study identifies that weaknesses in system design and integration can inhibit its realisation in practice.

This study had some limitations. First the data were collected from a single RACF site and community pharmacy. While these results may be transferable to Australian RACFs in general, variance in technological infrastructures of these settings may result in additional considerations. However, it is important to note that the electronic systems used by the participant pharmacy are commonly used by Australian community pharmacies. Although the findings from this study may not be able to be generalised to RACF settings at the international level, the evaluation of electronic systems in collaborative health care settings is of global relevance: therefore, readers of this study may be able to infer some relevance for their local health care settings.

Clinical Relevance Statement

This study will help aid in the design and implementation of electronic medication management systems in RACF settings. The findings outline the significance of identifying design weaknesses which negatively impact workflows of involved stakeholder organisations (e.g. RACFs, community pharmacists) in collaborative healthcare management. Study emphasizes the instrumental role of in-practice formative evaluation to determine the effectiveness and efficiency of eMAR design before the organisation wide roll out.

Conflicts of interest

The author(s) declare that they have no competing interests.

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Protection of Human Subjects and Animals in Research

Ethics approval for the study was obtained from Human Research Ethics Committee (HC13091) at University of New South Wales, Sydney, Australia and was endorsed by UnitingCare Ageing NSW/ACT.

Authorship

All authors qualify for authorship by their substantial contributions to the research and production of the manuscript. All authors contributed to the conceptualisation and design of the study. AT, KO and EL undertook data collection and analysis. AT drafted the initial manuscript. EL, AG, TO, CK and JW contributed to results interpretation, iterative editing and critical revision of the manuscript. All authors read and approved the final manuscript.

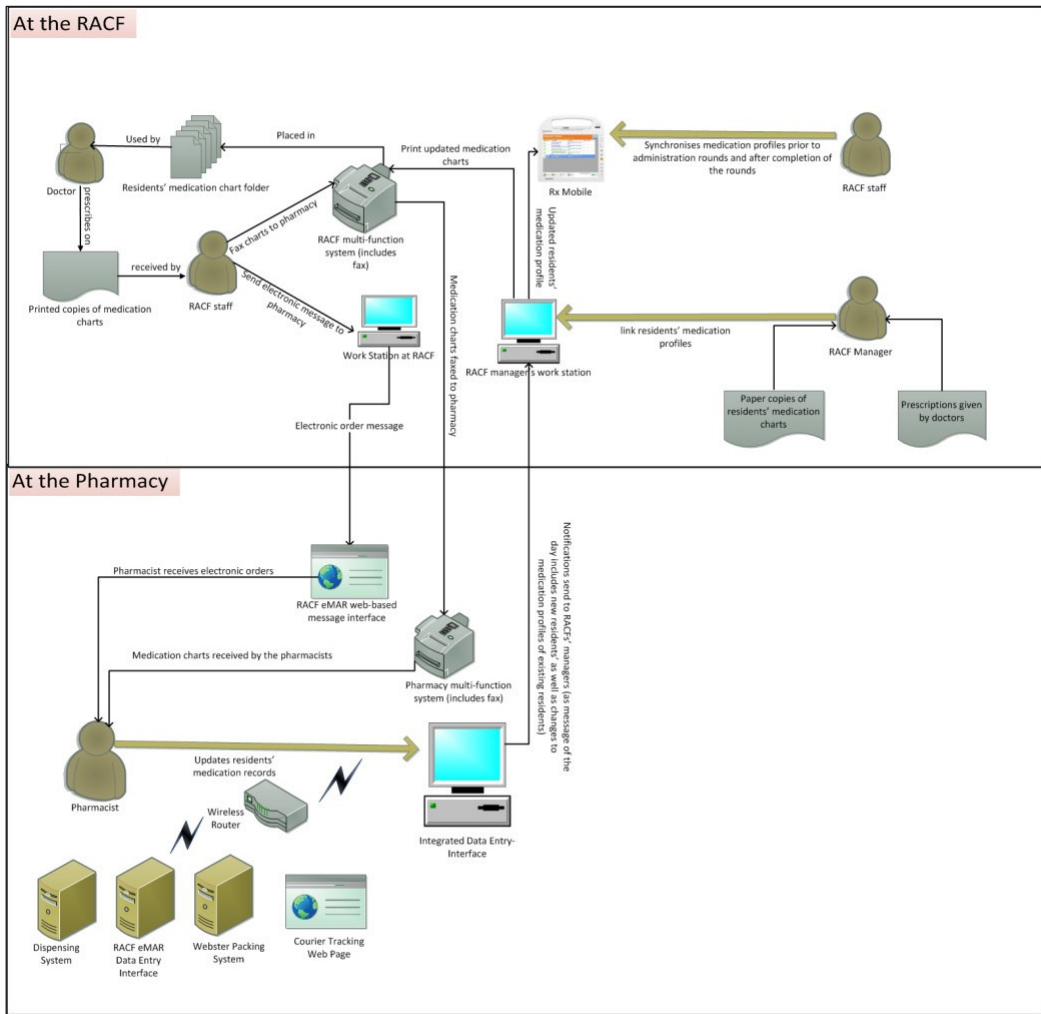


Fig. 1 Workflow – Data Entry for the eMAR system



Fig. 2 Message Alert Icon at the Pharmacy

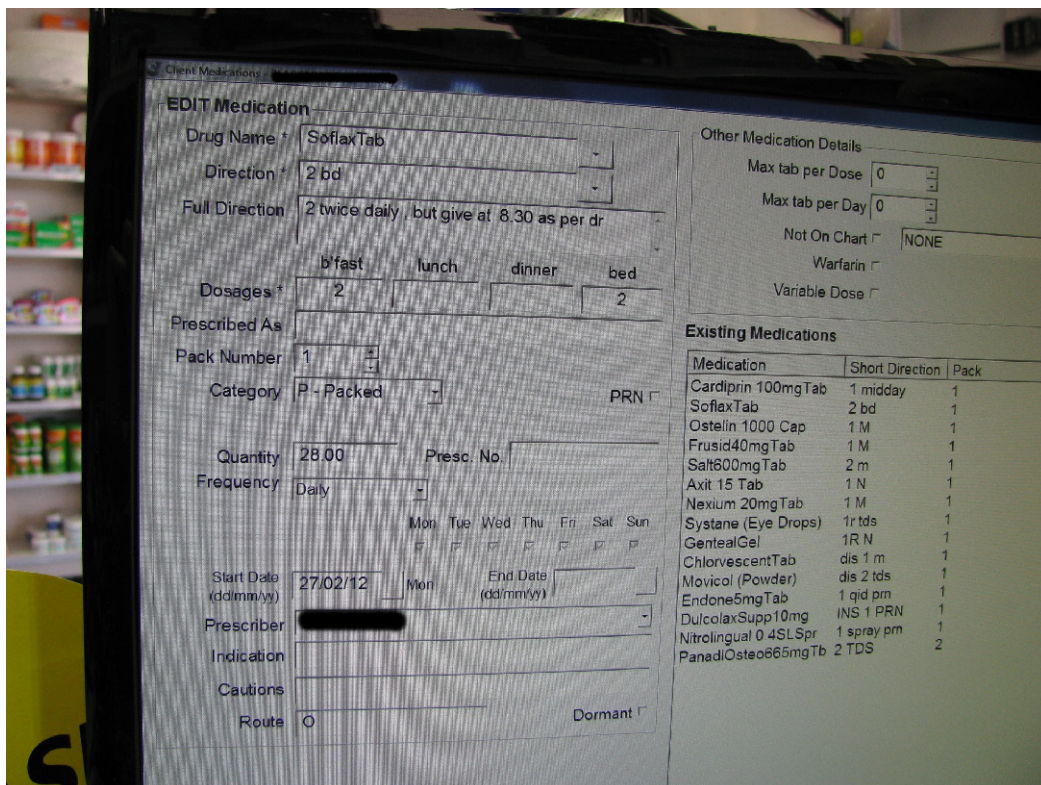


Fig. 3 'Full direction' used to describe a specific administration time

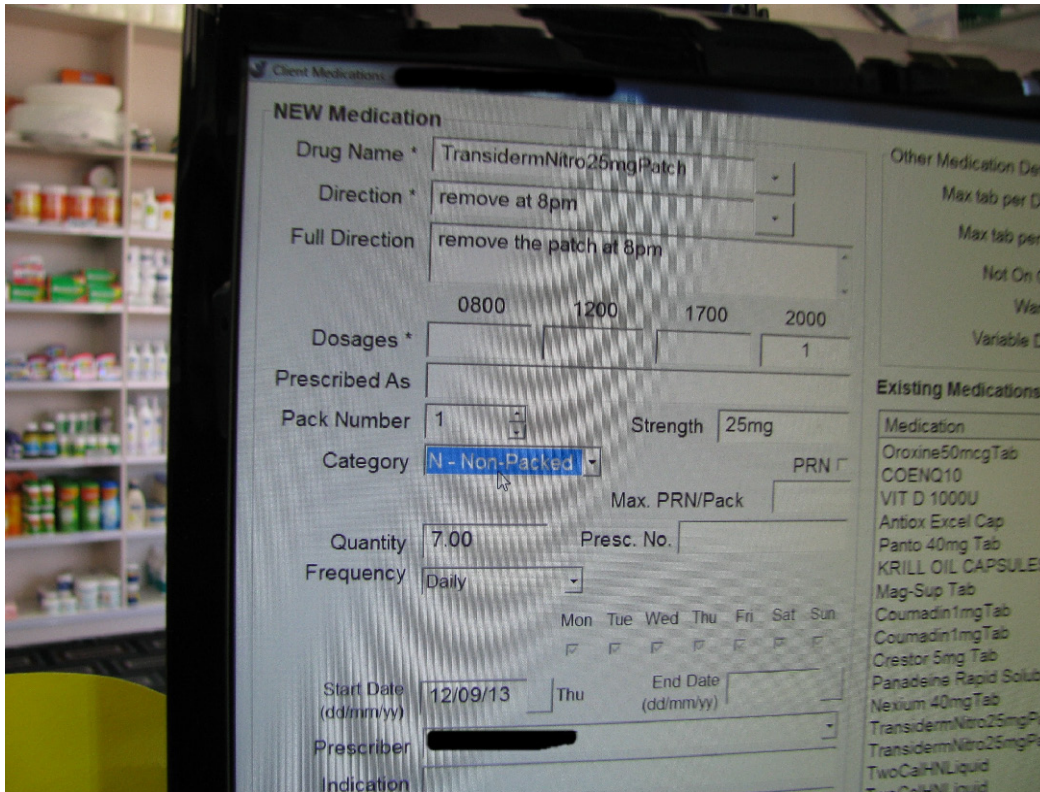


Fig. 4 A remove only entry for patches by the pharmacist

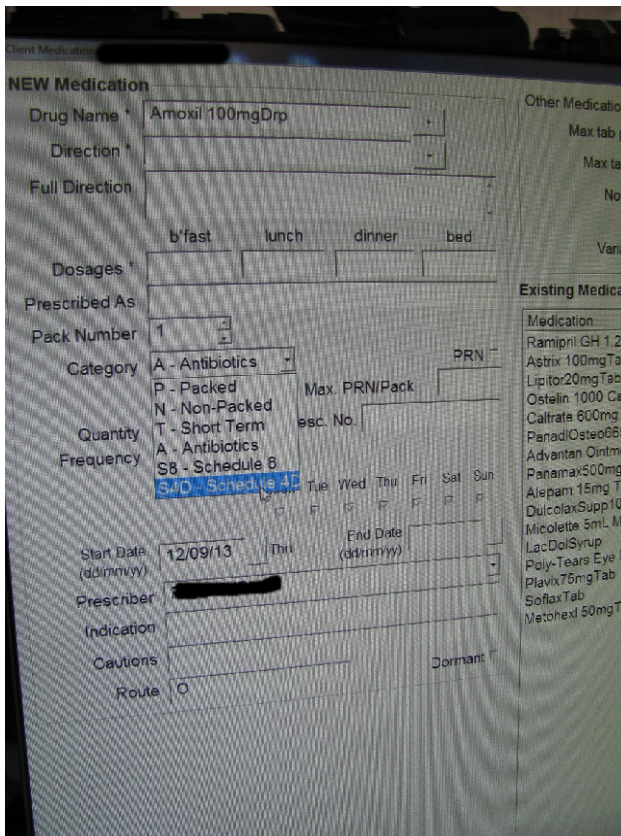


Fig. 5 Pharmacy interface showing drop-down list of possible medication categories

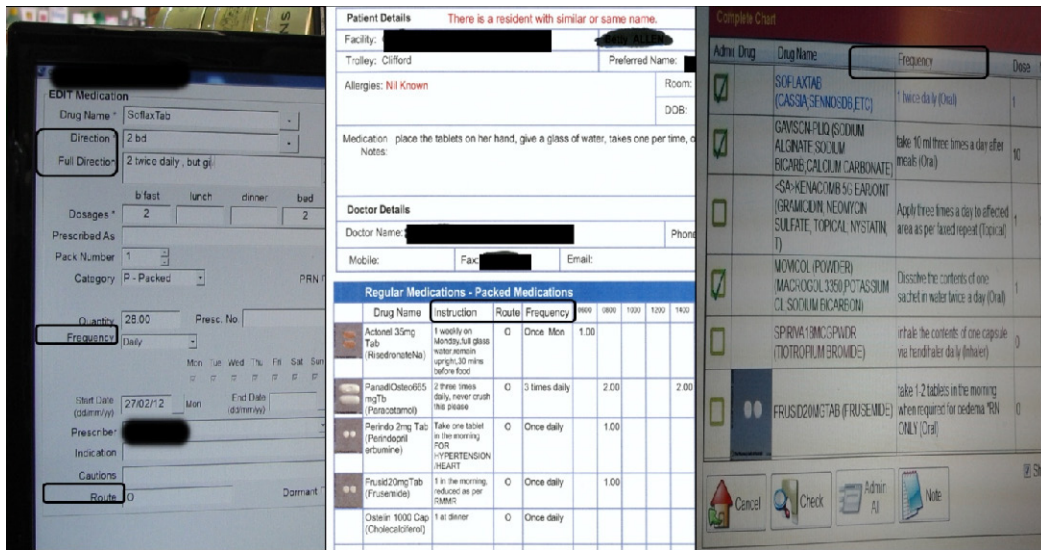


Fig. 6 Left: Pharmacy interface, Middle: Medication Profile View in eMAR, Right: Administration Profile in eMAR

Table 1 Key Steps Administration Rounds

- Log into the mobile tablets with appropriate login details
- Synchronise the data, to download the latest version of residents’ medication profiles
- Select the appropriate round (e.g. morning round). All residents who should be administered medications during the morning round appear on the tablet
- Place the tablet(s) on the medication trolley (s) and take them to the administration location (e.g. dining hall)
- Select a resident, by clicking their name to load the relevant medication profile on the tablet
- If the staff member is not RN, count the number of medications to be given and double-check that the same number of medications are available in a blister pack provided by the community pharmacy. If administering staff is a registered nurse(RN), check medications and sign for each individually
- Prepare any non-packed medications (if required)
- Administer the medications to the resident
- Select each non packed medication in the residents’ profile to record its administration status.
- Once administration round is complete, dock the tablets to upload latest administration records (includes the reason why a medication due during that round was not administered for example a resident being absent or in hospital)

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