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A study of pharmacy services provided to hospital admission units in Wales

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THE need to demonstrate the value pharmacy services bring to the care of patients is greater now than ever.^{1,2} Medicines reconciliation on admission is relatively easy to measure, common to pharmacy departments and internationally recognised as essential in reducing medication errors, therefore the pharmacy service can contribute to assessments of value.^{3,4} This study looks at pharmacy services provided to admission units across Wales to determine how much time they actually give, what activities they carry out and how much value to the care of patients they provide.

It was in 2007 that the National Patient Safety Agency and the National Institute for Health and Clinical Excellence published their joint patient safety solution for medicines reconciliation on admission to hospital. This guidance recommended that all healthcare organisations admitting adult inpatients should make sure that medicines reconciliation is undertaken as soon as possible after admission, with 24 hours following admission being considered a reasonable time-limit target.⁵

In Wales the "1,000 lives" patient safety campaign made medicines reconciliation one of its main work areas within the "Improving medicines management" programme.⁶ The Welsh Government has a core efficiency and

ABSTRACT

Aim

To ascertain the provision of pharmacy services to hospital admission units across Wales.

Design

The principles and processes used were based on those devised in a previous all-Wales study, where trainee pharmacists submitted data as part of the audit process. Comparison of data was facilitated by using a uniform method.

Subjects

Data were collected in the emergency/unscheduled admissions units at 14 hospitals. All patients admitted for a continuous 14-day period between October 2010 and February 2011 were included.

Outcome measures

To quantify the time spent on different activities by pharmacy staff, to assess the percentage of patients with medicines reconciled within 24 hours and to quantify the number and type of information sources used in medicines reconciliation.

Results

The average pharmacist spent three hours and 10 minutes a day, and the average technician spent three hours and 14 minutes in the admission units. The most common pharmacist activities were reviewing current patients and medicines reconciliation. For technicians it was medicines ordering. Overall, 55 per cent of patients had medicines reconciled within 24 hours. This increased to 67 per cent when patients were excluded whose medicines were not reconciled as a result of death, discharge or transfer to another hospital. The most commonly used medication history information source at 38 per cent was GPs.

Conclusion

The admission unit pharmacy service undertakes a variety of activities in Welsh hospitals, with pharmacists providing more clinically orientated ones. This pharmacy service is achieving medicines reconciliation within 24 hours for just over a half of all patients. The continuing need for further development and optimisation of pharmacy services on admission units remains of paramount importance.

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productivity performance indicator requiring health boards to determine the percentage of patients having their medicines reconciled within 24 hours of admission.⁷ This study presents an audit of medicines reconciliation within 24 hours of admission across 14 Welsh hospitals.

Over four-fifths of medication errors that occur during the admission process originate within the medication history.⁸ This means the first step in reconciling the medicines of patients is to ensure an accurate medication history is collected.⁹ This can improve patient safety at the time of admission by, for example, revealing the reasons for the admission, preventing a delay in medicines administration and identifying any non-adherence issues.^{10,11}

The definitive method for determining an accurate medication history has not been described although using more than one information source is recognised as good practice.^{12,13} The all-Wales medication chart allows the information source(s) used for establishing the medication history to be recorded. This study investigates the medication history information sources used in the medicines reconciliation process on admission across the 14 Welsh hospitals.

On admission units it is not only through medicines reconciliation that the pharmacy service can limit the harm occurring to patients. Focusing on more clinically orientated activities maximises the patient-safety impact of pharmacists by using their time and expertise most effectively.¹⁴ Having

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an appropriate skill-mix of pharmacists and pharmacy technicians in the admission stage can enable pharmacists to provide these activities, help optimise medicines supply and increase the number of patients seen within 24 hours of admission by the pharmacy service.¹⁵ These are essential service-improvement requirements, given that nearly one in five of the errors that cause patient death or severe harm are due to the omission or delay in patients receiving the medicines they have been prescribed.¹⁶ Before this study no comparison had been made across Wales of how much time is spent by pharmacy departments in delivering services to admission units and what types of activities they are carrying out. This study investigates these factors across 14 Welsh hospitals.

Methods

An investigation into the provision of pharmacy services to admission units was carried out at 14 hospital sites by preregistration trainee pharmacists across Wales. During their preregistration year trainee pharmacists are required to participate in audit. Those who took part in this study collected and submitted data as part of an all-Wales audit process.

The standard used in this audit was that medicines reconciliation should occur within 24 hours of admission.⁵ The interpretation by the project oversight group was that this should be for 100 per cent of the adult patients admitted to emergency/unscheduled admission units across the participating Welsh hospitals.

The definition used for when medicines reconciliation had occurred was the point in time when a pharmacist had signed the front of the medication chart stating the medication history check had been undertaken, and any necessary actions had been implemented to address any required next steps resulting from the medication history check. Waiting for the prescriber to implement suggested changes, although of importance, was not considered a pharmacy-service measure within the medicines reconciliation process.

The 24-hour period was determined as starting when the patient was entered into the hospital's electronic inpatient recording system. Formal ethics approval was not required, given that the nature of this study was audit. However, each participating trainee pharmacist registered the study with his or her clinical audit department. A uniform method was used to ensure data collected across each site were comparable. The principles and processes of the methodology used in this study were based on those devised in a previous all-Wales study.¹⁷

A centrally produced data collection form was sent to participating trainee pharmacists for piloting at their individual sites. After feedback the forms were amended, ratified by the project oversight group and sent back to each trainee pharmacist. A frequently asked questions document was distributed for guidance. The targeted area for data collection was the emergency/unscheduled admissions

PANEL 1: DEFINITIONS USED

All Wales chart medication history information source category	Definition used for predetermined medication history information source category
Patient	Information provided from the patient either verbally, written, or both, that is considered reliable
GP	Information provided by GP or GP surgery either verbally, written, or both, that is considered reliable. This category includes GP letters, repeat prescriptions, telephone confirmation, faxes, computer print-outs
Nursing homes and residential homes	Information provided from nursing/residential home either verbally, written or both that is considered reliable. This category includes medicines administration record charts
Patient's own medicine(s)	Patient's own medicine(s) brought in with the patient, or following admission, that is considered reliable
Carer	Information provided by the patient's carer/relative verbally, written, or both that is considered reliable
Other	Any other information source used and not covered by the previous options

unit at each hospital site, which was usually a single ward. If there was not an unscheduled/emergency admissions unit in the hospital a general medical or surgical ward where admissions take place was to be selected.

To determine the medication history information source(s) used in the process of medicines reconciliation the categories printed on the all-Wales medication chart were used. Standard definitions of these categories were provided to all data collection sites to ensure consistency of data collection. These categories are presented in Panel 1.

Data collection started on a Thursday for a continuous 14-day period between October 2010 and February 2011. The trainee pharmacists at each site completed individual data-collection forms and presented the site data at their own sites and at the all-Wales preregistration trainee pharmacist audit poster day. All of the data collected were entered into an electronic database and sent to the central data co-ordinator. The data from all sites was then analysed as one data set. Within the data analysis exclusions were applied to allow for factors that were considered out of the control of the pharmacy service but potentially affecting the audit standard of medicines reconciliation within 24 hours of admission.

Results

Pharmacy service provision to admission units On weekdays 255 pharmacy visits to admission units were recorded, and at weekends there were 14. For each day of the study there was a mean average of 21 beds seen per visit with an average time spent visiting each bed of 16 minutes. The pharmacy service to admission units was provided by pharmacists and technicians. The average visit time per day for pharmacists and

TABLE 1: ACTIVITIES

Pharmacist and technician activities undertaken on admission units

Activity	Number of occurrences	
	Pharmacist	Technician
Attend post take ward round	67	12
Obtain medication history	242	184
Medicines reconciliation	272	121
Review current patients	268	114
Dispense discharges	17	109
Clinically check discharges	193	1
Accuracy check discharges	127	17
Order medicines	214	196
Other activities	118	50
	1,518	804

technicians was three hours and 10 minutes, and three hours and 14 minutes, respectively.

Pharmacy service activities undertaken on admission units Data collection for the activities on the admission units was divided into two role types, pharmacist and technician. Each role type could be recorded as undertaking one or more of nine possible daily activities. Given that data collection took place over 14 days at each site and the study was undertaken at 14 hospitals this gave a possible overall total of 1,764 activities for each role type in the study. The total number of activities recorded for pharmacists was 1,518,

TABLE 2: MEDICINES RECONCILIATION

	Medicines reconciliation within 24 hours of admission	
	All patients	Excluding discharges, transfers and deaths within 24 hours of admission
All patients	55% (n=1556/2830)	67% (n=1556/2308)
Weekdays	60% (n=1327/2200)	75% (n=1327/1780)
Weekends	36% (n=224/630)	42% (n=224/528)

TABLE 3: SOURCES USED

The number of times the different medication history information sources were used to undertake medicines reconciliation.

Source	Times used
Patient	883
GP	1,256
Nursing home/residential home	102
Patients' own medicines	731
Carer	41
Other	280
Not specified	38
	3,331

TABLE 4: NO OF SOURCES

The number of patients and the number of medication history information sources used to undertake medicines reconciliation

No of sources used	Patients
1	838
2	789
3	270
4	25
5	1

and for technicians was 804. Of the pharmacist activities, the most common were reviewing current patients, at 18 per cent (n=268), undertaking medicines reconciliation, also at 18 per cent (n=272) and obtaining a medication history at 16 per cent (n=242). For technicians the most common activities were ordering medicines at 24 per cent (n=196), obtaining a medication history at 23 per cent (n=184) and medicines reconciliation at 15 per cent (n=121). Other activities by pharmacists included the ordering of medicines at 14 per cent (n=214) and by technicians checking the accuracy of discharge prescriptions at 2 per cent (n=17). Table 1 shows the pharmacist and technician activities undertaken on admission units.

Medicines reconciliation within 24 hours The 14 hospitals that participated in the study admitted a total of 2,830 patients. Of all patients admitted 55 per cent (n=1,556) had their medicines reconciled within 24 hours of admission. When those patients with medicines not reconciled owing to death,

discharge or transfer to another hospital within 24 hours are excluded (n=522), 67 per cent (n=1,556) of the remaining patients had their medicines reconciled within 24 hours. Table 2 summarises the varying percentages of medicines reconciliation within 24 hours of admission. For patients whose age was recorded (n=675) 66 per cent (n=446) had a medication history on admission of more than six medicines, of which 79 per cent (n=351/446) were over 65 years of age.

Number and type of medication history information sources used The medication history information source(s) used to undertake medicines reconciliation was recorded for 93 per cent (n=1,923/2,060) of patients who had their medicines reconciled at some point during their admission. Of these patients a total of 3,331 information sources were used, with the GP being the most common at 38 per cent (n=1,256). The next most common source was the patient at 27 per cent (n=883), and patients' own medicines made up 22 per cent (n=731). Table 3 shows the medication history information sources used to undertake medicines reconciliation and the number of times these were used.

Of the 1,923 patients for whom the information source of the medication history was recorded, the GP was used as a source in 65 per cent of patients (n=1,256). This was the single information source in 26 per cent of patients (n=504). The patient was used as an information source in 46 per cent of patients (n=883) and as a single source in 7 per cent (n=137). Patients' own medicines were used as an information source in 38 per cent of patients (n=731) and as a single source in 2 per cent (n=45).

Table 4 shows the number of patients with the varying number of medication history information sources used for the reconciliation of their medicines.

Discussion

Throughout Welsh hospitals pharmacists and technicians undertake a variety of activities on admission units. Overall, pharmacists undertake more clinically orientated activities, with technicians focusing on more technical roles. However, our data indicate an overlap of some functions, with 14 per cent of the recorded pharmacist activities being the ordering of medicines and 16 per cent being the obtaining of medication histories, both of which can be undertaken by suitably trained technicians.

Whether suitably trained technicians were available when the pharmacists were undertaking these activities did not form part of this study and should be looked at further to optimise the pharmacy workforce skill mix.

However, when staffing profiles permit it is essential that pharmacists spend as much time as possible on clinically orientated activities, with technicians undertaking all the activities they are empowered to by their new and extended roles. This will help to ensure the whole pharmacy service provides the best value in the care of patients on admission to hospital.

Given that there is variation between admission units for the time spent and activities undertaken on them it is appropriate that there is further investigation of the data to allow a sharing of good practice. Also, this study has not investigated the activities on admission units of pharmacy staff other than pharmacists and technicians. Other staff include pharmacy assistants, whose activities should be considered in any future work.

Across Wales the pharmacy service is achieving medicines reconciliation within 24 hours of admission for 55 per cent of patients. The pharmacy factors that might contribute to this rate include the reduced service time available at weekends and out of hours. It may also be attributable to patient factors such as the age of the patient and the number of medicines within the patient's medication history; such patients are more likely to require extra input for their medicines to be reconciled. Other relevant factors are that patients are sometimes discharged, transferred to another hospital or die within 24 hours of admission.

It is highly unlikely that the target of 100 per cent for all adult patients having their medicines reconciled within 24 hours of admission can be achieved, whatever the level of pharmacy service provision to admission units. Accepting this provides an opportunity to start considering the most effective strategy for medicines reconciliation in the future. The greatest value is likely to come from targeted interventions to high-risk patients in a similar manner to those processes that have been implemented following discharge.^{18,19}

It is of concern that only one medication history information source was used to undertake medicines reconciliation in such a high number of patients, given that using more than one information source is recognised as good practice.^{12,13} The most common category of information source used to formulate a medication history is that of GP. But there are a number of limitations to using the GP as the sole information source.¹² Most notably, current acute medicines may not be listed, the patient may have been verbally told to alter dosages with a time lag to when the electronic list was updated, and medicines supplied by outpatient clinics may not be included.²⁰ These need to be rectified given the high value that is being placed on this information source category for medicines reconciliation.

Conclusion

Across Wales pharmacy departments are providing essential services in the care of patients on admission units via a variety of activities. Medicines reconciliation is one activity that can help indicate the value of these services. However, a 100 per cent target for reconciliation to be completed within 24 hours of admission is not achievable for all adult patients and a method of targeting services to the most appropriate patients should be considered.

In the process of medicines reconciliation the lack of a gold-standard medication history information source means current practice has limitations. The continuing need for further development and optimisation of pharmacy services on admission units remains of paramount importance.

Recommendations Pharmacy activities on admission units should be routinely measured to assess the value to the care of patients that these essential services provide.

A 100 per cent target for all adult patients to have their medicines reconciled within 24 hours of admission is not achievable and the performance indicator needs further investigation and revision. Pharmacy service providers should consider investigating methods of targeting patients for whom the greatest value from medicines reconciliation on admission to hospital will be achieved.

The development of a single complete information source for a patient's medication history must remain a high priority.

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