

Improving medication history recording and the identification of drug-related problems in an A&E department

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OBJECTIVE — To determine the incidence of drug-related problems (DRPs), and completeness of medication history taking in an accident and emergency (A&E) department, and to compare the differences in recording of medication histories between doctors and clinical pharmacists.

METHODS — The study comprised two phases. Phase 1 was a three-month study that took place after a clinical pharmacy service to the A&E department had been set up in April 2002. A&E department staff were asked to make intervention records where they noted that medication histories were incomplete or patients had DRPs. Phase 2 was a retrospective study to compare the recording of medication histories by doctors and pharmacists.

RESULTS — In Phase 1, out of a total of 480 admissions, 203 intervention records were completed. Of these, 200 were made by pharmacists, two by doctors and one by a nurse. Of the pharmacists' interventions, 25 were DRPs and all three of the non-pharmacists' interventions were DRPs. DRPs therefore accounted for 5.8 per cent of A&E department admissions. Phase 2 showed that complete medication histories were recorded by doctors in 12.5 per cent of cases compared with 100 per cent of cases by clinical pharmacists.

CONCLUSION — This study suggests that the recording of DRPs in patients presenting to the A&E department is poor, and the percentage of complete medication histories taken is low, in the absence of a pharmacist.

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The numbers of patients, particularly older people, attending accident and emergency (A&E) departments continues to rise.^{1,2} At Newcastle General Hospital, an average of 200 patients attend the A&E department each day, with approximately 50 patients being admitted from there to hospital wards. Half of these admissions are older patients, who are often on multiple drug therapy and can therefore have complicated medicine regimens.

Several studies have shown that pharmacists can elicit a more complete medication history than doctors or nurses, resulting in more appropriate prescribing.³⁻⁵ In addition, the Audit Commission's "Spoonful of sugar" report states that in some hospitals in England, 30 per cent of patients have incorrect or incomplete medicines recorded on admission.⁶ This can lead to an increase in drug interactions between a patient's existing medicines and any new medicines introduced at hospital and in adverse events, therefore reducing the quality of care received and increasing the length of stay in hospital.

In addition, various studies have identified adverse drug reactions as a cause of admission to hospital, with figures ranging from 6.2 to 10.1 per cent of adult admissions,^{7,8} and 5 to 17 per cent of elderly admissions.^{9,10} Clinical pharmacists have made a significant impact on the wards by identifying drug-related problems (DRPs) and improving patient care.^{11,12}

Staff at the A&E department at Newcastle General Hospital have not previously had the benefit of routinely receiving the knowledge and skills of clinical pharmacists. Therefore, in an attempt to improve patient care by identifying DRPs before patients are admitted into hospital from the A&E department, managers at the pharmacy and emergency departments decided to appoint senior clinical pharmacists to the A&E department. Two such pharmacists were appointed in April 2002. Between them, they provide dedicated full time cover to the A&E department.

Although there have been previous studies demonstrating the benefits of having admissions pharmacists on wards,¹³⁻¹⁵ few studies, if any, have evaluated the potential benefits realised by providing a dedicated clinical

pharmacy service to A&E departments. The study objectives were therefore:

- To determine the DRP rate (ie, number of DRPs per 100 patients attending the A&E department and then admitted to hospital) in an inner city teaching hospital
- To compare the extent to which DRPs and complete medication histories are recorded by clinical pharmacists and doctors (ie, A&E department senior house officers)
- To describe the activities of a clinical pharmacist in an A&E department from the interventions recorded

Methods

Phase 1 Phase 1 was undertaken after the appointment of the A&E department pharmacists in April 2002.

A&E department staff (ie, pharmacists, doctors and nurses) were asked to complete intervention records where they noticed that medication histories (taken by junior doctors when a patient first attended the A&E department) were incomplete or where there were DRPs. Data were collected using a structured intervention record devised by Clark *et al.*¹⁶ and classified according to the categories detailed in Panel 1 (p110). Where pharmacists noticed that medication histories were incomplete, they corrected them. For some patients, pharmacists completed the patient's initial medication histories.

The study covered patients who attended the A&E department at the Newcastle General Hospital during the clinical pharmacists working hours (Monday to Friday, 10am to 7pm) and who were subsequently admitted to any of the Newcastle upon Tyne hospitals (ie, Newcastle General Hospital, Royal Victoria Infirmary or Freeman Hospital).

Phase 2 A retrospective study was undertaken to compare the extent to which complete medication histories were recorded by doctors and pharmacists. As for phase 1, the study related to patients who attended the A&E department at Newcastle General Hospital and who were subsequently admitted as medical inpatients to any of the

Panel 1: Categories of information contained on an intervention record form

Patient details

Person who made the intervention

- Pharmacist
- Doctor
- Nurse
- Patient
- Other

Problem type

- Incomplete drug history recorded
- Prescription illegal or illegible
- Formulary issue
- Administration or formulation issue
- Patient education required
- Dose or frequency issue
- Duration issue
- Adverse drug reaction noted
- Potential for drug interaction
- Choice of therapy issue
- Therapeutic drug monitoring or pharmacokinetic evaluation required
- Pharmacological issue
- Miscellaneous issue

Result of intervention

- Prescription altered
- Prescription unaltered (advice accepted)
- Prescription unaltered (advice rejected)
- Resolved without doctor
- Intervention was for information only
- Other

Main reason for intervention

- Safety
- Effectiveness
- Value for money
- Patient care
- Controlled Drug legislation

Time taken making the intervention

- 0 to 5 minutes
- 6 to 10 minutes
- 11 to 15 minutes
- 16 to 20 minutes
- 20 to 50 minutes
- More than 50 minutes

Newcastle Upon Tyne hospitals. Admissions of patients who were not taking any medicines before admission were excluded from the study.

For doctors, the medication histories analysed were 200 that were taken by doctors between 1 and 31 January 2002 (ie, a period before A&E department pharmacists were in post and before phase 1 of the study began). These were selected randomly from A&E department cards. For pharmacists, the medication histories were the 200 that were taken by pharmacists during phase 1 of the study (ie, 175 taken as a result of noticing that the medication histories taken by doctors were incomplete and 25 histories taken by pharmacists before patients were seen by a doctor).

The medication histories recorded by doctors and pharmacists were assessed and

compared for completeness and accuracy according to the criteria set out in Panel 2.

The number of complete medication histories made by each group were calculated and recorded in a database (Minitab Release 14). Data were then analysed using a two sample *t*-Test, and a *P* value of less than 0.05 was regarded as being significant. Where medication histories were incomplete, a note was made of which information was missing.

Ethics approval for the study was not required at the time it was undertaken.

Results

Phase 1 A total of 480 patients attended the A&E department and were admitted from there to one of the Newcastle upon Tyne hospitals in the three-month study period. For these patients, intervention records were completed for 203 patients, 200 by a clinical pharmacist, two by a doctor and one by a nurse.

Table 1 shows the number of interventions made by pharmacists and the "problem type" to which they related. Of these interventions, 25 were DRPs (ie, all the categories shown in Table 1, except "incomplete medication history"). All three of the non-pharmacists' interventions were DRPs.

Table 2 (p111) shows a breakdown of the 16 adverse drug reactions identified by pharmacists. It should be noted that in all of these instances, the pharmacist's advice was accepted by the relevant doctor and documented in the patient's notes. Where appropriate, the adverse drug reactions were reported to the Committee on the Safety of Medicines by the pharmacist using the "yellow card scheme".

The time taken to identify and resolve each of the pharmacists' interventions is shown in Table 3 (p111). The majority of interventions (78 per cent) were complete within 15 minutes. The most resource-intensive interventions were identifying and managing adverse drug reactions and drug interactions. Out of 18 interventions of these types, seven took 20 to 50 minutes to resolve and three took more than 50 minutes.

Phase 2 Pharmacists completed 100 per cent of their 200 medication histories accurately, with doctors completing only 12.5 per cent of their 200 medication histories accurately. Statistical analysis showed that pharmacists were significantly more likely to

Table 1: Number of pharmacist interventions relating to the "problem types" set out in Panel 1

Problem type	Number of pharmacists interventions
Incomplete drug history recorded	175
Prescription illegal or illegible	0
Formulary issue	0
Administration or formulation issue	0
Patient education required	1
Dose or frequency issue	2
Duration issue	0
Adverse drug reaction in patient noticed	16
Potential for drug interaction	2
Choice of therapy issue	1
Therapeutic drug monitoring or pharmacokinetic evaluation required	0
Pharmacological issue	1
Miscellaneous issue	2

Panel 2: Details required when taking a complete medication history

- Confirm that the patient is taking medicines regularly
- Identify the name of the drug
- Identify the dose of the drug
- Identify the frequency of administration
- Include any over-the-counter drugs that the patient is taking

Table 2: Further information about the 16 adverse drug reactions (ADRs) identified by pharmacists during intervention recording

Number of ADRs	Class of drug associated with ADR	Type of effect associated with ADR
5	Antihypertensive	Postural hypotension
4	Non-steroidal anti-inflammatory drug	Abdominal pain, nausea or gastrointestinal bleed
4	Antidepressant	Seizure
2	Antiepileptic	Bradycardia, hypotension, dizziness, falls
1	Decongestant	Palpitations, increased blood pressure

take a complete medication history ($P=0.03$). With regard to the medication histories taken by doctors, 61.5 per cent included the drug name, but the dose and the frequency of administration were each missed on 75 per cent of occasions.

Discussion

DRPs and interventions This study identified a slightly higher DRP rate in admissions to hospital wards from A&E departments than previous studies — 5.8 per cent as compared with 3.5 per cent⁵ and 4 per cent.⁵ Even so, it is our opinion that the DRP rate we show here does not reflect that which would be found during peak time attendances (ie, weekends) and that, if this study was carried out on a 24 hours a day, seven days a week basis, the DRP rate would be higher still.

The study also suggests that doctors do not effectively identify DRPs in patients admitted to hospital from the A&E department (only 0.4 per cent of the admissions included in the study were identified as being associated with DRPs by doctors). DRPs can be associated with serious adverse effects, resulting in increased morbidity and mortality, and identifying them is therefore crucial. Having the pharmacist present to identify and resolve these problems as early as possible in a patient's journey through hospital clearly maximises patient safety. This reason alone justifies the presence of clinical pharmacists in A&E departments.

Complete medication histories The study shows the dramatic difference between doctors and pharmacists in recording complete medication histories. We think that reasons for this include that pharmacists' expertise means they are more likely to recognise the importance of taking an accurate medication history and that pharmacists are also more able to devote more time to this activity. Again, the differences in the tendency of pharmacists and doctors to take complete medication histories justifies pharmacists' presence in A&E departments.

Under the scheme that is now in place at

Newcastle General Hospital, partially as a result of this project, pharmacists are now the main medication history-takers in the A&E department. They use a number of methods to do so, including reviewing any medicines that patients bring into hospital, speaking with patients or their relatives and telephoning the patients' general practitioners. If a patient fails to remember the name of their tablets or capsules, the A&E department pharmacist can often identify them from a description (eg, blue tablet). In most cases, pharmacists interview patients in the A&E department before they are seen by a doctor, meaning that doctors can focus on other issues when they are speaking to patients.

There are also implications at ward level. If a patient is admitted to a ward with a complete medication history having been carried out by an A&E department pharmacist then the time of admissions ward pharmacists and doctors is saved, because they do not have to repeat the task. Arguments in favour of having pharmacists carry out medication reviews in A&E departments rather than, say, admissions wards include that some additional relevant information might be available from this environment — for example, from ambulance staff or patients' relatives. Events might also be more fresh in patients' mind. It needs, however, to be borne in mind that patients (and their relatives) do not always give a thorough

Table 3: Length of time taken to resolve each of the pharmacists' interventions

Time taken (minutes)	Number of interventions
0 to 5	56
6 to 10	63
11 to 15	36
16 to 20	27
20 to 50	15
More than 50	3

account of the medicines they are taking. In any case, the presence of pharmacists helps A&E department staff in other ways (see "limitations" section below).

Research has shown that pharmacists are efficient at taking medication histories — for example, they spent an average of 13.4 minutes interviewing patients, with nurses spending an average of 24.3 minutes.⁵ The ability to take medication histories and resolve any associated DRPs quickly is particularly important in A&E departments, where there is a fast turnover of patients and problems need to be resolved in a limited period.

Limitations A number of limitations are recognised in the design and execution of the study. First, one of the aims of the study was to describe the activities of clinical pharmacists in the A&E department from the interventions they made in this study. The role of the A&E pharmacists developed dramatically once they were in place and cannot be defined just in relation to the interventions they make. For example, pharmacists now supply and administer medicines to patients under patient group directions, teach nursing and medical staff about drug-related aspects of care, counsel patients who are being discharged directly from the emergency department about any new medicines they have been given and make up the more complex intravenous drug infusions.

Second, for the retrospective analysis (phase 2), there may have been more incomplete medication histories than the number documented. Under the old system, if patients could not remember the names of their prescribed medicines, doctors might not have recorded any information about medicines for that admission, and so that admission would have been excluded from the study.

Third, we recognise that other factors (such as drug allergies, patients' compliance with medicine regimens and their understanding of their medicines) could have been included in the details required for a complete medication history.

Finally, we have not evaluated the impact of providing a dedicated service to the emergency department on the pharmacy departments overall workflow.

Conclusion

This study highlighted that omissions occurred in the recording of medication histories and identifying DRPs when these were carried out by doctors in the A&E department at Newcastle General Hospital. Some of these omissions may have been clinically relevant.

The presence of a clinical pharmacist in the A&E department has improved medication history taking and DRP identification.

It has also made all staff aware that obtaining complete details about medicines is important when patients attend A&E departments. Ensuring that medication histories are recorded accurately in an A&E department will help to minimise risk at the first stage in patients' journeys through hospital. It is also important in promoting patient safety and reducing medication errors.

Further studies will be required to evaluate the benefits of the other activities carried out by A&E department pharmacists. Moreover, an ideal model would be to have in place a team of clinical pharmacists covering the A&E department 24 hours a day, seven days a week. If this were to be adopted at Newcastle, its benefits should also be assessed.

The A&E department at Newcastle General Hospital has benefited significantly from the presence of clinical pharmacist and would recommend replication of this model in other A&E departments.

A&E pharmacy careers

An article looking at careers for pharmacists in A&E departments, based on practice at the Queen's Medical Centre, Nottingham, appeared in last month's issue of *Hospital Pharmacist* (2005;12:61-4)

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