

The contribution of a pharmacy admissions service to patient care

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ABSTRACT – The aim of this study was to determine the impact of two specialised admissions pharmacists on an acute medical admissions ward. For a one-week period, contributions made to the medical post-take ward round (PTWR), the number of drug histories taken and interventions made as a result, and the availability of medication needed on discharge were documented. An average of 1.1 contributions per patient were made on the PTWR; a large proportion of these concerned therapeutic choice. Pharmacists also intervened to stop medication due to adverse drug reactions in 12% (n=10) of contributions. Fifty-two drug histories were checked by a pharmacist, resulting in 61 interventions (1.1 interventions per patient). The majority of interventions resulted from the unintentional omission of a regular medication (65%, n=39). Only 24% (n=29) of items needed on discharge had to be dispensed in pharmacy and 33% (n=41) were available as patients' own drugs.

KEY WORDS: admissions pharmacists, adverse drug reactions, drug history, medical admissions unit

Background

It has been established in the UK that drug histories taken by doctors on admission can be inaccurate.¹ This may be because the patient is too ill or confused to give an accurate history, or because they were admitted outside of normal hours when it can be difficult to confirm their usual medication. Time pressures, urgent investigations and the needs of other patients may also preclude the immediate taking of a complete drug history. McFadzean *et al* found that pharmacists made fewer errors than junior doctors when taking a history (65% v 5%) and that the latter tended to rely on letters from general practitioners (GPs), 52% of which contained an inaccurate or no drug history. The most common errors were drug omissions and incorrect doses.² A 2005 study found that only 12.5% of drug histories taken by doctors in accident and emergency (A&E) departments were complete, compared with 100% of those taken by a clinical pharmacist.³

An incorrect drug history on admission may lead to a delay in identifying potential adverse drug reactions (ADRs). A 2004 study of 18,820 patients admitted to two NHS hospitals over a six-month period found that 6.5% of admissions related to an ADR, and in 80% the ADR was directly responsible for the admission.⁴ Two other studies of drug-related admissions on medical admissions units found that 6.5%⁵ and 10.1%⁶ of admissions were drug related. Both included ADRs, treatment failure and non-compliance, however one excluded intentional overdose.⁵

Shah *et al* found that an admissions pharmacist reduced medication risk by detecting potential errors before medication was administered, improved the timeliness of its supply and ensured that pharmaceutical interventions occurred more quickly.⁷ Brady and Dean also found that significantly more pharmaceutical interventions were made each day after the appointment of an admissions pharmacist and that the interventions were of greater clinical significance.⁸

Following the Audit Commission's report, *A spoonful of sugar*, a 'dispensing for discharge' system was implemented at Hammersmith Hospitals NHS Trust (HHNT).^{9,10} Under this system the use of patients' own drugs (PODs) is encouraged and regular medicines are dispensed as original packs and labelled with directions. The aim is to reduce drug costs and make medication readily available at discharge, therefore minimising delays.

There is still little research evaluating the impact of admissions pharmacists and no previous studies have explored their impact on the timely supply of medication at discharge. The aim of this study was to assess the impact of two newly created admissions pharmacist posts on the care of patients on medical admissions wards at Charing Cross Hospital. The objectives were:

- to record the number and types of contributions to patient care made by the pharmacist during the medical post-take ward round (PTWR)
- to evaluate the percentage of patients whose drug histories were checked by the pharmacist on the admissions wards
- to assess the number and nature of pharmaceutical interventions made as a result of checking the history

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- to evaluate the impact of the pharmacist on the source of medications needed for discharge.

Methods

Setting

At the time of this study the acute medicine team at HHNT was responsible for all acute medical admissions, with the medical consultants operating a one week on-take rota system. Any new patients at Charing Cross Hospital, where this audit was undertaken, were admitted to one of two admissions wards (5W or the coronary care unit (CCU)) and seen the following morning on the PTWR by the on-take consultant. The consultant and team then decided or confirmed an appropriate treatment and discharge plan, including which specialty should take over the care if more than 72 hours of inpatient treatment was anticipated. The patients were then transferred to the appropriate ward as soon as possible.

Four new posts were created at HHNT in 2004 to enable the pharmacy department to provide a specialist admissions service to the acute medical admissions wards and A&E departments. Two admissions pharmacists were employed at each of Charing Cross and Hammersmith hospitals, working a rota to provide a service from 0800 to 1930 Monday to Friday, and 0800 to 1300

at weekends. The pharmacists attend the daily PTWR, take drug histories and facilitate discharge and medicines supply. They aim to check each patient’s drug history before they are seen on the PTWR, however this is often not possible as some are admitted overnight and outside of the pharmacist’s working hours.

Some medical patients who were admitted through A&E and whose discharge was anticipated to be straightforward (for example, those requiring observation or social services input) were transferred to the emergency admissions unit (EAU) and remained under the A&E, rather than acute medicine, team. These patients were not included in this audit.

Data collection

Data were collected over a period of seven days, beginning 6 April 2005. As this work was considered an audit, ethics approval was not required.

Contributions to post-take ward round

The PTWR included newly admitted patients in A&E, the A&E ward, the acute medical admissions ward (5W) and the CCU. All patients seen on the PTWR were included, and all contributions were documented by the attending pharmacist. Contributions were defined and classified using the method of Bednall *et al* (Table 1).¹¹

Drug histories

This aspect of the study focused only on the admissions ward. The ward admissions book was used to determine the number of patients admitted during the study period. Details of every patient who had their drug history taken and who was on the acute medical admissions ward were recorded and any interventions made were classified (Table 2).

Table 1. Categories used to classify interventions made on the post-take ward round.

Classification	Description
Therapeutic discussion	Discussion on therapeutic area initiated by pharmacist but recommendations not implemented
Therapeutic choice	Class and dose of drug was prescribed as advised by the pharmacist
Advice on route/formulation	Pharmacist advised change of route or formulation to enable the patient to take medication as prescribed
Dose adjustment	Pharmacist advised on doses prescribed or amended those previously prescribed where appropriate eg reduced doses in renal failure
ADR/advised stopping	Pharmacist identified symptoms as potential ADRs or side effects or advised stopping drug due to other problems eg stopping NSAIDs in acute renal failure
Therapeutic drug monitoring	Pharmacist advised on timing of samples and interpretation of results.
Allergy status	Pharmacist checked allergy status where none was documented
Counselling	Pharmacist counselled the patient on their medication

ADR = adverse drug reaction; NSAIDs = non-steroidal anti-inflammatory drugs.

Table 2. Categories used to classify interventions made following drug history taking.

Classification	Description
Allergy status	Pharmacist checked allergy status where none was documented, or drug allergies were documented on the drug chart incorrectly
Drug	A drug the patient normally takes was unintentionally omitted from the chart, or the wrong drug had been prescribed
Dose	The dose prescribed had been unintentionally changed
Formulation	The formulation prescribed had been unintentionally changed
Frequency	The frequency prescribed had been unintentionally changed
Route	The route prescribed had been unintentionally changed

Supply of medication at discharge

Every discharge prescription (to take away (TTA)) seen by the admissions pharmacist for patients on the admissions ward was documented and the source of each item prescribed was determined using the classification shown in Table 3.

Results

Contributions to post-take ward round

Seventy-four patients were seen by a pharmacist on a PTWR during the study period (mean 11 per day). For these patients, a total of 83 contributions were made (mean 1.1 contributions per patient, range 0–4). Therapeutic choice was the most common type of intervention (40%, n=33) (Table 4). Other examples included:

- recommending adding enoxaparin as the patient was immobile
- recommending a cessation of felodipine as the main problem was oedema
- changing ‘when required for sleep’ dosulepin to temazepam for a patient admitted with acute coronary syndrome.

Table 3. Categories used to classify the whereabouts of items needed for completion of discharge prescriptions.

Classification	Description
PODs on ward	POD on the ward (in bedside cabinet)
PODs at home	Patient has plenty at home, no supply needed
Dispense as TTA	Items had already been dispensed for discharge and were in patient's bedside cabinet
TTA pack on ward	Drug in pharmacy cupboard on ward and supplied as either TTA pack or by satellite labelling
Supply relabelled	Supply available (either POD or as TTA) but needed relabelling before discharge
Sent up in chute	Drug dispensed in pharmacy and sent to ward via pneumatic chute

PODs = patients' own drugs; TTA = to take away (discharge prescription).

Table 4. Contributions (n=83) made on post-take ward round.

	TD	TC	Advice on route/ formulation	DA	ADR	TDM	Allergy status	C
Number	9	33	1	17	10	3	9	1
(%)	(11)	(40)	(1)	(20)	(12)	(4)	(11)	(1)

ADR = adverse drug reaction; C = counselling; DA = dose adjustment; TC = therapeutic choice; TD= therapeutic discussion; TDM = therapeutic drug monitoring.

Drug histories

Of the 93 patients admitted to the ward during the study period (mean 13.2 per day) a total of 52 (56%) had their drug histories checked by a pharmacist, resulting in 61 interventions (mean 1.1 per patient). The most common intervention was to recommend the prescription of a drug that had been unintentionally omitted (65%, n=39), followed by clarification of the allergy status (19%, n=11) (Table 5). Examples of contributions made following the taking of drug histories include:

- timing and frequency of Sinemet Plus® and Half-Sinemet CR® corrected
- patient allergic to penicillin, cephalosporins and possibly tetracyclines (anaphylaxis); no allergy information documented on chart so added
- prescription for prednisolone corrected from daily to alternate days.

Supply of medication at discharge

Nineteen TTAs were seen by the admissions pharmacist over the course of the audit representing 20% of patients admitted to the ward. They comprised 121 medications. Most of the medication needed had already been dispensed for discharge (30%, n=36) or were available as PODs, either on the ward or at home (33%, n=41). Only 24% (n=29) of all items had to be dispensed in the pharmacy department (Table 6).

Discussion

Contributions to post-take ward round

A mean of 1.1 contributions were made per patient. The importance of these contributions was not formally assessed, however 40% (n=33) were classed as ‘therapeutic choice’ meaning that the class and dose of drug was subsequently prescribed as advised by the pharmacist. This high percentage suggests that pharmacists are making valuable contributions to patient care.

Of the contributions, 20% (n=17) concerned the adjustment of a dose, or recommended a dose for a drug about to be prescribed. This removes the need for the pharmacist to contact the doctor after the prescription has been written (when one or more doses may have already been given). It also provides instant feedback to doctors when prescribing. It is possible, however, that this may lead to doctors relying on pharmacists and becoming unfamiliar with reference sources, such as the British National

Formulary (BNF). Of the contributions made to the PTWR 11% (n=9) involved allergy status – either establishing allergy status where none was documented, or amending incorrect allergy information on the drug chart. One patient’s medication chart had no allergy status documented when the patient actually had severe allergies to both penicillin and cephalosporins and a possible allergy to tetracyclines. This was a potentially life-threatening omission and the pharmacist was able to advise on the necessity of complete allergy documentation.

These results contrast with those of Bednall *et al* who found that approximately equal numbers of contributions were made concerning therapeutic discussion, therapeutic choice and dose adjustment.¹¹ Only 1.6% of the contributions made in their ‘therapy review’ category involved the identification of a potential ADR or side effect. They also made 1.8 contributions per patient seen which is more than in this study, however 42% of their contributions included supply of inpatient and discharge medication and drug history taking which were evaluated separately in this study. Accounting for this, Bednall *et al* made approximately 1.0 intervention per patient, which is very similar to this piece of work.

Drug histories

Of those admitted to the acute medical admissions ward 56% (n=52) had a drug history taken by the admissions pharmacist. This relates an average of 7.4 patients per day. There are several reasons why drug histories were not checked for all patients:

- There is a rapid turnover of patients with an average of 13.2 admissions to 5W per day; all patients should be transferred within 72 hours to another ward, and many are transferred within 24 hours.
- The admissions pharmacists usually perform a medication review at the same time as taking a drug history, considering whether drugs and doses are appropriate and whether any should be started or stopped in view of the

patient’s medical condition. This process usually takes longer than simply checking the current medication list and the more pharmaceutically complex patients are targeted. Therefore the more straightforward cases may not have their drug history taken on the admissions ward.

- Some patients are almost immediately discharged and if their admission is unrelated to medication, eg infection, a drug history may not be taken.

Unsurprisingly, the largest proportion of interventions were made as a result of the unintentional omission of regular medication (65%, n=39). Anecdotally it is believed that the most likely medications to be unintentionally omitted from a drug history include inhalers, eye drops, once-weekly drugs, such as bisphosphonates and methotrexate, and ‘when required’ medication. The impact of these omissions was not assessed in this study although it may be an area for audit in the future.

Incorrect dose, formulation or route occurred rarely, however incorrect frequency comprised 12% (n=7) of the interventions made following drug history taking. Of these, the medication was incorrectly prescribed as once daily in four cases. This is most likely due to unfamiliarity with some drugs, leading doctors to assume that they are taken in a dose of one tablet, once a day.

The impact of having an incorrect drug history is potentially serious. If the history is incorrect on admission, potential ADRs and interactions may be missed. On discharge, the patient and their GP may be confused about whether medication has been intentionally stopped in hospital and, if a patient resumes taking an old medication on discharge, this could lead to re-admission due to interactions with new drugs. A study conducted in 1992 found that six to 14 days post-discharge, 45 out of 50 patients had one or more changes made to their medication.¹² Most of these changes had not been reviewed by their GP. A further study found that unintentional discrepancies in medication were significantly reduced by obtaining a full drug history on admission, educating patients on their medicines and summarising changes for the GP on discharge.¹³

Table 5. Interventions (n=61) made as a result of drug history taking.

	Allergy status	Drug omitted	Incorrect dose	Incorrect formulation	Incorrect frequency	Route
Number	11	39	3	1	7	0
(%)	(18)	(64)	(5)	(2)	(11)	(0)

Table 6. Whereabouts of items (n=121) needed for completion of discharge prescriptions.

	PODs on ward	PODs at home	Dispensed as TTA	TTA pack on ward	Supply relabelled	Supply sent up in chute	Dispensed in pharmacy
Number	15	26	36	13	1	1	29
(%)	(12)	(21)	(30)	(11)	(1)	(1)	(24)

POD = patients’ own drug; TTA = to take away (discharge prescription).

Supply of medication at discharge

Over the seven-day study period a total of 19 TTAs were seen by the admissions pharmacists. Prior to the introduction of the admissions pharmacists, most of these would have been taken to the pharmacy department for dispensing.

Being available on the ward, the admissions pharmacists were able to check with patients what they had at home as well as the medication they had brought with them. This meant the hospital did not have to supply a third of all items prescribed. A recent audit conducted on the admissions ward at Charing Cross Hospital has indicated that approximately £22,000 per year is saved by the use of PODs (D Robinson, June 2006, unpublished local audit). Only a quarter of all items prescribed needed to be dispensed in pharmacy, and 43% of items (n=51) were available on the ward at the time of discharge. The median turnaround time for a TTA at Charing Cross Hospital is 1 hour 30 min (BD Franklin, K O'Grady and L Voncina, July 2006, unpublished local research); local data shows that 56% of TTAs for the admissions ward are completed in 15 minutes or less, thus saving time and allowing patients to be discharged sooner.

Limitations

Data collection was time consuming and it is possible that this resulted in fewer drug histories being checked than usual. It is also possible that some contributions made on the PTWR were not recorded due to time constraints. Only two consultants were on take throughout the course of the study week. Each consultant has their own specialty and approaches their role in acute medicine in a different way. It is likely that the type and number of interventions depend on the specialist knowledge of the consultant, the speed of their PTWR and their receptiveness towards pharmacist contributions. However, anecdotally, it is believed that the study week was a fairly typical week. It is also probable that the number and nature of interventions may change depending on the pharmacist covering the PTWR and ward on a given day.

Recommendations and conclusions

Several developments have been made as a result of this work:

- A label printer has been installed on the admissions ward enabling the relabelling of PODs and other drugs, further reducing the workload on the dispensary and expediting discharge.
- If drug histories cannot be checked, guidelines have been written to ensure that patients are appropriately prioritised for history taking.
- In the future, doctors will be encouraged to contact the admissions pharmacists when they are clerking complex patients in A&E; this will reduce duplication of work and enable an accurate drug history to be established earlier in the patient's admission.

Further areas for audit include evaluating the severity of pre-

scribing errors made and exploring the proportion of patients who have all items on the TTA available at the time of discharge.

To conclude, the admissions pharmacists play a major part in the therapeutic decision-making process on the PTWR and make many interventions as a result of drug history taking. They have also reduced the amount of medication that is supplied to patients on discharge and facilitated rapid discharge by using PODs and dispensing medication directly from the ward.

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