Pharmacist-acquired medication histories in a university hospital emergency department

MELINDA K. CARTER, DENNIS M. ALLIN, LEIGH ANNE SCOTT, AND DENNIS GRAUER

Purpose. A study was conducted to identify discrepancies between medication histories taken by emergency department (ED) providers (physicians, nurses, and medical students) and medication histories taken by clinical pharmacists.

Methods. During a three-month period, a clinical pharmacist was assigned to the ED in a 475-bed, tertiary care teaching facility that serves as a level I trauma center. On the arrival of a patient, ED providers completed a standard assessment that included the patient’s medication history. Patients to be admitted through the ED were interviewed by the clinical pharmacist. In addition to a medication history, the pharmacist collected the patient’s height, weight, immunization history, and allergy information. The medication history obtained by the ED provider was compared with the history obtained by the clinical pharmacist, and discrepancies were documented.

Results. The clinical pharmacists in the ED performed 286 medication histories; 34 were excluded. The remaining 252 histories taken were used in the study. The pharmacists identified 1096 home medications versus 817 home medications documented by ED providers. Of the 817 home medications documented by the ED, the regimens of 637 (78%) were incomplete and were supplemented with dosing information by the pharmacists. Pharmacists reported 375 medication allergies versus 350 reported by ED providers. Immunization histories were obtained in 252 of the 252 (100%) pharmacist-acquired medication histories versus 45 of the 252 (18%) acquired by ED personnel.

Conclusion. Pharmacist-acquired medication histories in the ED were more complete than those acquired by other health professionals.

Index terms: Clinical pharmacists; Clinical pharmacy; Health professions; Hospitals; Patient information; Pharmaceutical services

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The expanding role of pharmacists in hospitals and health systems has been well documented. Numerous studies illustrating cost control, optimization of antimicrobial use, diabetic and anticoagulation management, and the detection and control of hypertension have been published, but relatively little published literature exists on the role of clinical pharmacists in the emergency department (ED).

Prescribing medication is a key component in patient care, regardless of the setting. Physicians must have a complete description of the drugs a patient uses in order to make appropriate diagnostic and prescribing decisions. A complete medication history includes a list of all medications, their doses, and their routes and frequency of administration. Getting a complete picture of the patient’s current drug therapy is particularly challenging in the ED where patients have been seen concurrently, or sequentially, by several physicians. Incomplete or inaccurate medication histories may lead to the duplication of drugs, unexpected interactions, inadvertent discontinuation of medications, or failure to detect drug-related problems.

In 1999, the Institute of Medicine reported that at least 44,000, and perhaps as many as 98,000, Americans die per year as a result of medical errors.1 Over one half of the medical errors were medication errors. The highest frequency of preventable adverse events in hospitals occurs in the ED.2 The number of patient visits to the ED continues to

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increase while the number of EDs is declining, leading to increased overcrowding. The volume of patients seen in EDs combined with the lack of pharmacist involvement in the medication-use process in most institutions may negatively affect patient safety.

We conducted a study to identify discrepancies between medication histories taken by ED providers (physicians, nurses, and medical students) and medication histories obtained by clinical pharmacists.

Background

The University of Kansas Hospital is an academic medical center, with the area’s only nationally certified level I trauma center. A full range of care is provided through 475 staffed inpatient beds and outpatient services. Total ED visits in fiscal year 2005 (FY05) exceeded 40,000. Approximately 35% of the hospital’s reported 19,699 inpatient visits were admitted through the ED, and the hospital operated at capacity for most of FY05. A new ED and other expansions scheduled to open in the fall of 2006 will provide 88 more beds. Continued increases in the number of hospital admissions are expected.

The 2005 National Patient Safety Goals of the Joint Commission on Accreditation for Healthcare Organizations require that institutions (1) “develop a process for obtaining and documenting a complete list of the patient’s current medications upon the patient’s admission to the organization [including a “comparison of the medications the organization provides to those on the list”] and with the involvement of the patient” and (2) communicate “a complete list of the patient’s medications . . . to the next provider of service when it refers or transfers the patient to another setting, service, practitioner or level of care within and outside the organization.”

Medication histories taken in the ED frequently contribute to the generation of medication regimens for patients admitted to the hospital. Inaccurate or incomplete histories could contribute to unsafe conditions for patients. Since a large percentage of the patients at the University of Kansas Hospital are admitted through the ED, a mechanism for obtaining complete and accurate medication histories in the ED is a critical element for meeting patient safety guidelines and ensuring that medication reconciliation occurs on admission, at each transfer, and on discharge.

According to the Massachusetts Coalition for the Prevention of Medication Errors, the omission of a home medication from admission orders is the most common medication error that occurs in the medication reconciliation process, followed by incorrect dosages on admission orders. Medication reconciliation has proven to be an effective strategy for reducing medical errors by decreasing the rate of medication errors (70–80%) and adverse drug events (by over 15%). Safe practice recommendations include the adoption of a standardized form for medication reconciliation and the placement of the form in a consistent, highly visible location within the patient’s chart. Improving access to complete medication lists at admission and identifying time frames for completing the reconciliation process increase the identification and resolution rates for variances.

Methods

During a three-month period in 2005, a clinical pharmacist was assigned to the ED at the University of Kansas Hospital. On the arrival of a patient, ED providers completed a standard assessment, including obtaining the patient’s medication history. Patients to be admitted to the hospital through the ED were later identified by the clinical pharmacist and subsequently interviewed at various times between 9 a.m. and 11 p.m.

During the interview, the clinical pharmacist solicited information concerning all medications used before hospitalization. A structured form was used to guide the interview and record the answers. All interviews were conducted at the patient’s bedside in the ED. Although information on nonprescription medications and dietary supplements was collected and recorded during the medication history, it was not included in the results to allow the final results of our study to be compared with those of similar studies. The only exclusions were patients (or patients’ surrogates) who were unable to provide medication history information or whose ED provider-obtained medication history was unavailable for comparison.

In addition to the medication history, the pharmacist collected the patient’s height, weight, immunization history, and allergy history. The sources of information included the patient, caregivers, family members, prescription vials, medication lists from nursing facilities, follow-up telephone conversations with community pharmacies and physicians’ offices, and discharge information on the patient’s medications from recent hospital admissions (after validating current home use). The medication history and additional information obtained by the clinical pharmacist were next compared to the assessment done by the ED providers, and discrepancies were documented.
Medication histories obtained by the ED providers were considered incomplete if the pharmacist supplied additional drugs and dosing information, such as the dosage amount or how often the medication was taken.

**Results**

The clinical pharmacists in the ED performed 286 medication histories during the three-month study period. For various reasons, such as an emergency procedure outside the ED or the inability of the patient or caregivers to provide medication information, the assessment made by the ED providers was not always available for comparison with the clinical pharmacists’ data; therefore, 34 (12%) of the pharmacists’ medication histories and patient interviews were excluded. The remaining 252 histories taken were included in the study results.

The mean age of the patients assessed during the study was 51.8 years (age range, 2 months–92 years). The most common chief complaint was shortness of breath (36 patients [14.3%]), followed closely by chest pain (33 patients [13%]). The numbers of prescribed medications at the time of admission were 0–4 for 113 patients (44.8%), 5–9 for 76 (30.2%), 10–14 for 45 (17.9%), 15–19 for 11 (4.4%), and 20–26 for 8 (3.2%).

Medication discrepancies were defined as a medication missing, a medication with incomplete dosing information (e.g., dose, frequency of dosing times), or medication or dosing information that was inaccurate. The most common type of discrepancy was the omission of dosing information (78%) followed by the omission of a medication that the patient was taking before admission (25%). (Discrepancy types were not mutually exclusive.)

Clinical pharmacists identified 1096 home medications compared with 817 home medications identified by ED providers. Collateral sources, such as prescription vials and phone calls to patients’ retail pharmacies and physicians’ offices, were often used by pharmacists to verify and supplement information provided by patients, family members, and care providers. Of the 817 home medications documented by ED providers, the regimens of 637 (78%) were incomplete and were supplemented with additional dosing information, such as route of administration and frequency of dosing, obtained by the clinical pharmacists. The clinical pharmacists reported 375 medication allergies versus 350 medication allergies obtained by ED providers, and the corresponding description of allergic reactions was documented in 200 of the 375 (53%) allergies obtained by the clinical pharmacists compared with 8 reactions documented for the 350 (2%) allergies obtained by the ED providers. The clinical pharmacists documented asking for a description of the allergic reaction 100% of the time; however, family members, caregivers, physicians’ offices, and pharmacies from whom medication histories were often collected did not always have information on the manner of the allergic reaction. In addition, immunization histories were obtained in 252 of the 252 (100%) pharmacist-acquired medication histories versus 45 of the 252 (18%) medication histories obtained by ED providers.

During the study period, the pharmacist also participated in approximately one emergency resuscitation per week, provided compatibility and dosing information, answered questions regarding drug selection, corrected and clarified admission orders, changed nonformulary medications to equivalent formulary options, identified medications brought in by patients, and provided general drug information.

**Discussion**

Medication errors are one of the most common causes of avoidable harm to patients admitted to hospitals. This study demonstrated that medication histories taken by ED providers are often incomplete compared with medication histories taken by clinical pharmacists. The clinical pharmacists used multiple sources to gather a complete medication history (i.e., calling the patient’s physician’s office or local pharmacy) that the ED providers did not. ED providers did not record approximately 25% of the prescription drugs patients were taking at home during the initial assessment. Our estimate of completeness is somewhat conservative since we excluded nonprescription drugs and dietary supplements from the results. The medical necessity of the various nonprescription drugs and supplements was often ambiguous. Therefore, the pharmacists collected information on nonprescription drugs and supplements patients were using; however, this information was not included or evaluated during the comparison with medication histories obtained by the ED providers.

Because of logistic constraints, it was not possible to interview all of the patients admitted during the three-month study. Weekend and overnight medication histories were not obtained and therefore not evaluated. Discrepancy rates may differ on the basis of time of day and variations in workload; however, these factors were not considered.

Another limitation of this study was the absence of a gold standard for the identification of home medication use. The pharmacist had to rely on the responses of the patient or caregiver and added collateral information from prescription bottles and telephone contacts with physicians’ offices and pharmacies, whenever possible, to complete the history. However, a review of the literature suggests that our assessments provided the best available measure of patients’ actual home medication use.

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**NOTES**

**Emergency department**

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The results of this study were comparable with the results of a study by Beers et al. Although the Beers study included only persons over 65 years of age, results showed that 78% of the study patients had at least one error of omission on hospital admission. Our results also agreed with Beers findings that omission errors were much more common than commission errors (the recording of medications patients deny using).

By providing physicians with a complete description of the drugs a patient uses, appropriate diagnostic and prescribing decisions can be made. A complete medication history, including a list of all medications, doses, routes, and frequencies, gives physicians the complete picture of a patient’s current drug therapy. Without a complete medication history, duplication of drugs, unexpected interactions, inadvertent discontinuation of medications, and failure to detect other drug-related problems could occur.

On the basis of the results of this study, two pharmacist positions were formally requested for the ED and medication reconciliation duties. Recruitment is in progress.

Conclusion
Pharmacist-acquired medication histories in the ED were more complete than those acquired by other health professionals.

References