ORIGINAL ARTICLE

Physicians' Practice of Dispensing Medicines: A Qualitative Study

Daniel Darbyshire, MRCS, FHEA, PGCert (MedEd),* Morris Gordon, MRCPCH, MMed, FHEA, FAcadMEd†‡
Paul Baker, FRCP, FRCGP, DipEd†§ Damian Bates, FCEM,|| and Steven Agius, PhD§

Objectives: The physical act of giving medication to patients to administer away from a health care setting, dispensing, is normally performed by pharmacists. Dispensing of medication by physicians is a neglected patient safety issue, and having observed considerable variation in practice, the lead author sought to explore this issue further. A literature review yielded zero articles pertaining to this, so an exploratory study was commenced. The qualitative arm, relating to junior physicians' experience of, and training in, dispensing, is reported here.

Methods: Focus groups were conducted to explore the beliefs, ideas, and experiences of physicians-in-training pertaining to dispensing of medication. These were recorded and transcribed. The transcriptions were thematically analyzed using the grounded theory.

Results: The emergency department was the most common site of dispensing. No formal training in dispensing had been received. Informal training was variable in content and utility. The physicians felt that dispensing was part of their role.

Conclusions: Despite being expected to dispense, and the patient safety issues involved in giving drugs to patients to use at home, physicians do not feel that they have been trained to undertake this task. These findings from 1 hospital raise questions about the wider quality and safety of this practice.

Key Words: dispensing, drug safety, medical education, health care quality

(*J Patient Saf* 2014;00: 00–00)

Since the publication of the Institute of Medicine's report, *To Err Is Human*,[1] unprecedented levels of research activity have concentrated around making health care safer for patients. Domains such as attitudes to patient safety,[2] systems for patient safety,[3] patient safety–specific education,[4,5] and the effect of working hours on safety,[6] to name but a few, have been explored.

The patient safety literature is still evolving, but 1 thing that is clear is that events leading to a patient safety incident are multifactorial.[7,8] Methods aiming to improve safety must tackle problems from several angles.

Prescribing has received considerable attention in the literature,[9] with topics such as prescribing errors by junior physicians, competency assessments, and targeted educational interventions for prescribing forming much of the work.[10,11]

Dispensing is a distinct skill from prescribing. Dispensing of medication can be defined as "to give, provide or supply for later oral ingestion, insertion, application, injection or other use" a medication.[12] This is a task that

- is often expected of physicians, rather than pharmacists, in the acute hospital setting
- is mainly completed out of normal working hours
- is neglected in both undergraduate and postgraduate medical education
- if involving errors, can lead to serious untoward events

A literature search was performed. Using the National Health Service (NHS) Evidence tool, the following databases were searched: AMED, British Nursing Index, CINAHL, EMBASE, HMIC, MEDLINE, and PsycINFO. Multiple combinations of search terms were used including *dispensing*, *doctor*, *physician*, and *medical*. No articles were found discussing the physical act of dispensing of medication by physicians. A small selection of articles from South East Asia discussing the impact of separating prescribing and dispensing on the volume of, and cost thereof, medications to the state were identified from Google Scholar. These articles are not included because they relate primarily to direct costs and not the safety implications of physician dispensing.

This article is part of a wider study asking the question "how competent are junior physicians in dispensing medicine?" and follows on from an exploratory study looking at the completeness of documentation for medicines dispensed out of hours from an emergency department. Taking documentation completeness as a proxy for quality, it showed considerable discrepancies in documentation related to dispensing, with none of the prescription forms in the study completed correctly.[13]

Given the lack of previous literature around this issue, a further exploratory study was considered appropriate to investigate the education and experience of dispensing for physicians-in-training and to generate questions for further inquiry.[14,15]

METHODS

Participants

Participants were recruited by e-mail sent via the postgraduate center, the office that coordinates physicians-in-training education sessions locally, with posters set up in various locations and through word of mouth. No incentive to participate was offered. The lead researcher traveled to the participants to conduct the focus groups.

The participants were all junior physicians in the Northwestern Deanery, United Kingdom. In total, 10 junior physicians participated in the focus groups; 6 were foundation year 2 (FY2) physicians in their final 4-month placement, 2 were year 2 general practice specialty training (GPST2) physicians, and 2 were final-year general practice specialty training (GPST3) physicians. All except participant 8 (P8) had experience working in emergency medicine. Originally, 4 focus groups were planned, with provision for further interviews to be completed if sufficient information for analysis had not been collected (see Table 1 for a description of these terms and Table 2 for participant demographics).

From the *Department of Urology, Salford Royal Hospital; †Faculty of Health and Social Care, University of Salford, Salford; ‡Department of Paediatrics, Blackpool Victoria Hospital, Blackpool; §North Western Postgraduate Deanery, Manchester; and ||Emergency Department, Royal Bolton Hospital, Bolton, UK.
Correspondence: Daniel Darbyshire, MRCS, FHEA, PGCert (MedEd),
    22 Rostrevor Avenue, Stockton-on-Tees, TS19 9HW, UK
    (e-mail: dsdarbyshire@doctors.org.uk).
The authors disclose no conflict of interest.
Supplemental digital content is available for this article. Direct URL citations appear in the printed text and are provided in the HTML and PDF versions of this article on the journal's Web site (www.journalpatientsafety.com).

TABLE 1. Grade of Junior Physicians Included in the Study

Foundation Programme: "a two-year generic training programme which forms the bridge between medical school and specialist/general practice training"[16]

FY1: "enables medical graduates to begin to take supervised responsibility for patient care and consolidate the skills that they have learned at medical school. Satisfactory completion of F1 allows the relevant university to recommend to the GMC (General Medical Council) that the foundation doctor can be granted full registration"[16]

FY2: "remain under clinical supervision (as do all doctors in training) but take on increasing responsibility for patient care. In particular they begin to make management decisions as part of their progress towards independent practice"[16]

GPST: "To become an independent general practitioner in the UK, you must undertake at least three years of GP Specialty Training,"[17] and GPST1, GPST2, and GPST3 represent the year of training.

Three of the focus groups had 2 participants, 1 group had 3 participants, and 1 group had only 1 participant. The group with only 1 participant was originally planned to have 3, but last-minute cancellations occurred. The lead researcher decided that it was better to conduct a one-to-one interview than potentially losing the opportunity by rescheduling.

Data Collection

The focus groups were audio recorded then transcribed by the lead researcher within 24 hours of the group meeting. The lead researcher made notes of the nonverbal communication present during the meeting and recorded this with the transcript.

The focus groups were intended to be participant led and open. Seven questions were asked by the researcher to stimulate discussion and prompt the participants. They were developed from the authors' previous dispensing audit[13] and shown in Table 3. In many of the focus groups, the questions were not used because the discussion tended to cover all the content of the questions.

The length of the focus group interviews varied from 5 minutes 40 seconds to 14 minutes, with a mean of 9 minutes 32 seconds.

Ethics Approval

Research ethics approval was gained from the National Research Ethics Service (NRES) Committee North West–Greater

TABLE 2. Participant Demographics

Participant	Male/Female	Stage	Focus Group	Length
P1	Female	GPST3	1	7 min 24 s
P2	Female	GPST2	1	
P3	Female	FY2	2	5 min 40 s
P4	Male	GPST2	3	10 min 38 s
P5	Female	GPST3	3	
P6	Male	FY2	4	14 min
P7	Female	FY2	4	
P8	Female	FY2	4	
P9	Female	FY2	5	9 min 57 s
P10	Female	FY2	5	

TABLE 3. Prompt Questions for Use by the Researcher

Prompt Questions
What do you remember about the first time you dispensed medicine?
What areas do you think are important when dispensing medicine?
In what context does it usually take place?
Have you had any formal training or guidance?
Have you had any informal training or guidance?
Do any specific events around dispensing come to mind?
How do you think it could be improved?

Manchester West, and organizational approval was gained from the NHS North West Strategic Health Authority. Written and verbal information was provided to all participants, and written consent was obtained before any of the focus groups were commenced.

Data Analysis

After data collection, the focus group recordings were transcribed verbatim by the lead researcher. During this process, data were made anonymous by replacing names with pseudonyms. The audio transcriptions were then deleted.

After collection and processing, data were ceded using nVivo software (QRS International Pty Ltd, Doncaster, Victoria, Australia). This was performed as soon as possible after each focus group and allows the analysis "to feed into, or shape, the on-going data collection."[18] The analysis proceeded through 3 stages, consisting of open, axial, and selective coding, with constant comparison taking place throughout each phase.[19] Each stage provided categories that could be used to explore the themes of the data.

The data were thematically analyzed.[15] Both the process of conducting the focus groups and the task of coding were performed by the same researcher (DD) to allow for a greater depth of analysis. It is expected, and described in many qualitative research texts, that the process of data collection informs the analysis,[15,18] so it was felt important that the same individual completed both steps.

RESULTS

Several thematic areas were identified, which will be dealt with in turn starting with descriptive data about where, when, and what dispensing occurred. From here, the description moves onto the process of dispensing, the steps the participants describe going through when they have dispensed medication; this is divided into 2 subsections, the emergency department and the wards, because the process is quite different. After this, we explore several other areas that were repeatedly observed, such as the prescription charge, expectations, training, accountability, clinical incidents, safety practices, ideas for other systems and improvements, as well as how the process made trainees feel. The results below contain a small selection of supporting quotes; a more detailed account can be found online in Appendix 1 (Supplemental Digital Content 1, http://links.lww.com/JPS/A7).

Where, When, and What?

The emergency department was by far the most common location where the participants had dispensed medication, with all but 1 participant (P8), who had never worked in the emergency department, having experience in that locale. Although a less frequent occurrence, most of the participants had experience

dispensing medication from wards when on-call for a variety of specialties. Other locations were the hospice (P2), a community unit (P3), and a day case surgery unit (P7). Out-of-hours dispensing on the wards was haphazard, with the physicians signing the form, not really knowing what was required or why (P4, P7).

One participant discussed dispensing medication from the emergency department even during the hours when the pharmacy was open (P4). The other 9 participants discussed dispensing only "Out of hours and when pharmacy was closed" (P2).

The most common medications dispensed were analgesics and antibiotics. Other medications discussed were "Steroids for COPD" (P6), "Inhalers for asthmatics" (P6), and antihistamines such as "Piriton" (P7).

Process of Dispensing in the Emergency Department

Outlined below are the steps involved in dispensing from step 1 to 9 that emerged from the focus groups and thematic analysis; this is also represented in Figure 1. Like any complex process, the steps in dispensing are not always performed in the order presented.

(1) A patient is seen, and the decision is made that admission is not required but that a medication is needed. The prescription is written by the physician.

The process of choosing the correct medication and completing the prescription documentation is vital, but it was not the aim of this study to explore this process further.

(2) The dispensing practitioner retrieves the drug; this is usually from a locked cupboard specifically for drugs that can be dispensed from the department.

All except P8, who had not worked in emergency medicine, discussed this during the focus groups.

(3) Checking whether the medication is correct

Checking whether what was in the box matched what was on the label was discussed by 2 participants (P3, P9).

Checking the expiry was discussed by P9 and 1 other participant (P6).

(4) Instructions and patient details added to the box
(5) Prescription and medication checked by 2 members of the staff
(6) The patient fills in the payment exemption part of the form if appropriate

One of the focus groups yielded an interesting conversation between 2 of the participants that demonstrates the extremes of not doing this to an example of how it could be done effectively (P6, P7).

(7) Medication explained to the patient

This ranged from a brief discussion (P2, P5, P6) to a targeted process based on the patient in front of you (P1) to quite a reflective thought about whether one's practice had been adequate (P10).

(8) Medication given to the patient and documentation completed
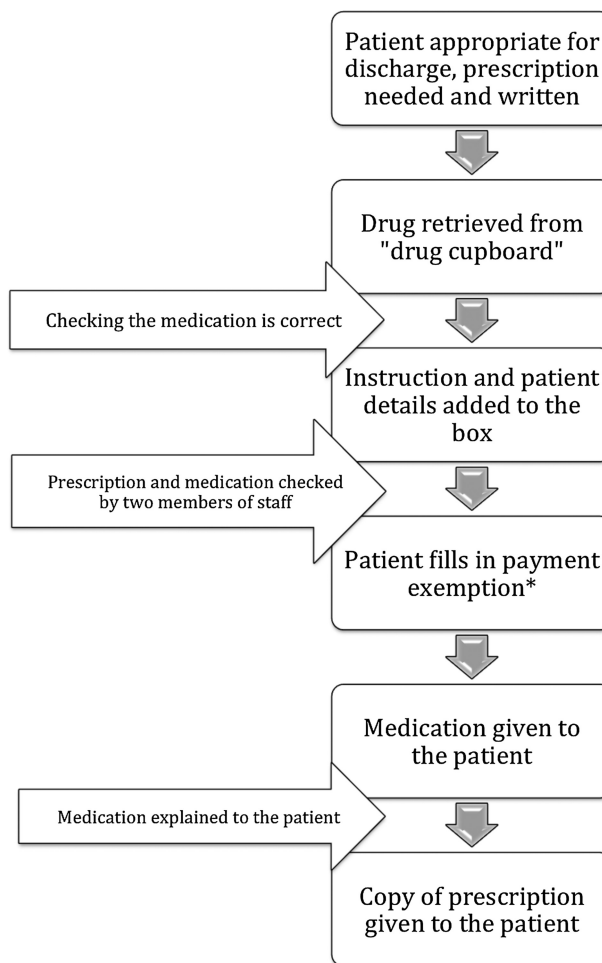(9) Correct copy of the prescription given to the patient

FIGURE 1. Process of dispensing medication in the emergency department (*where applicable).

Prescription Charge

One of the participants never mentioned this to her patients (P1), whereas another did not initially but did once she knew that she should (P7). Another participant informed his patients but did not feel that it was common practice (P6). No money was taken from patients in the emergency department; the process by which this was collected was discussed (P4, P5).

Expectation and Training

Several of the study participants discussed being expected to dispense medicines (P1, P5, P9). Their training to do so varied from none (P1, P5, P10) to some informal training (P9) through being shown around by a nurse (P2, P6, P7). Several of the participants thought that training might improve the situation (P7, P10).

Lack of Documentation, Accountability, and Safety

One participant discussed instances in which patients have been dispensed medication without a prescription.

"You do occasionally, actually, occasionally I have seen, in the eye room drops been given out." (P7)

When asked if they thought that this extended to other medications:

"Probably but I've not seen it." (P7)

Even when patients were provided with documentation, its quality and completeness led several participants to question whether dispensers could be made accountable for errors.

Double-checking was discussed as usual practice in the hospice. This, in part, led the trainee to feel that the process was tightly controlled in that environment (P1). Their statement also mentions a possible correlation between frequency of dispensing and quality of the process, something that was also mentioned in the context of the community unit (P3). None of the participants had personal experience of clinical incidents, but several discussed the potential (P2, P4, P5, P9).

Other Systems

During 1 of the discussions, 2 of the participants talked about their experience dispensing in other units, with electronic prescribing (P7) and dispensing systems (P6) featuring heavily. This led to discussions around other ideas for improvement. In addition to the comments about being trained how to dispense, more than 1 participant thought that some specific guidance on the legalities of the process would be useful (P9). Another participant would prefer not to have to do it at all (P10), whereas a different participant thought about a 24-hour pharmacy service (P9).

Participants' Feelings

Two of the participants talked directly about how dispensing medications made them feel. One found the task stressful, whereas the other felt uncomfortable doing it. Both related these feelings to being underprepared to dispense medicines (P3, P10). Perhaps this unpreparedness is why 1 participant felt the need to protect her (P5).

DISCUSSION

To our knowledge, this is the first study to explore the subject and is part of the authors' ongoing work in the area. The main findings are that dispensing by physicians in 1 hospital in the United Kingdom is primarily, but not exclusively, done in the emergency department and out of hours. The process by which this occurs is explored. Common problems include pressure or expectation that this task is performed despite a lack of confidence, training, and knowledge of how it should be done.

The main location in which dispensing occurred was the emergency department, although most areas of hospital medicine and some community practices were also mentioned. The emergency department is a major site of out-of-hours care, and given that most pharmacies within UK hospitals are open between 9 AM and 6 PM,[20] it is arguably not surprising that services that deliver most of their care in daylight hours dispense fewer medications out of hours. This is reflected by the theme of dispensing out of hours discussed by all but 1 of the participants.

Which medications were dispensed probably reflects the acute, treatable problems that emergency departments traditionally manage without admission. Although it is interesting to note that a previous study has shown that making a medication available in the emergency department, rather than accessible only via a central pharmacy, means that the drug is more likely to be given to patients.[21]

The 9-step process of dispensing medication in the emergency department outlined above reflects the process complexity[22] of a seemingly simple task.

Step 1 represents several distinct areas of practice involving patient assessment, decision making, and prescribing, each of which has its own body of literature that is beyond the scope and not within the remit of this article.

Steps 2, 4, 6, 8, and 9 all represent actions by the dispensing clinician, and at each stage, there is the potential for error.

Retrieving the drug from the cupboard (step 2) seems like a simple step, but the pharmacy literature is rife with studies describing which errors occur and why.[23] In hospital pharmacies, the main errors were dispensing the wrong drug, strength, form, or quantity.[24] Contributing errors reported include look-alike and sound-alike drugs,[23–26] high workload,[23,27] as well as distractions and interruptions[28,29]—all of which are potential problems in the emergency department setting. Correctly adding the patients' details to the dispensed medication and providing written instruction on how to take the medication, often in the form of a preprinted sticker (step 4), and actually giving the medication to the patient and documenting who did this (step 8) all have similar risks and contributors to error.

Ensuring that the patient fills in the payment exemption part of the form (step 6), if applicable, is important because, if this is incorrectly filled or omitted, this can create lots of work for the pharmacy administration staff and potentially lose the department income. This is not relevant for all hospitals because some do not charge for prescriptions dispensed in the emergency department.[30]

Steps 3 and 5 are double-checks, which act as safety nets, a widely used practice in health care and other industries.[31,32] The utility of the double-check when administering or dispensing medication has been studied, although not widely, with 1 systematic review concluding that "there is insufficient evidence to support or refute the practice,"[33] although there is evidence that it reduces error rates in inpatient drug administration[34] and dispensing.[35] The impact on patient outcomes is unclear,[33] and the practice is manpower intensive.[33,34]

Informing patients about how to use a medication and the rationale for its use is an important part of the process of discharging a patient from a hospital. Studies from different contexts have shown that doing this well may improve patient outcomes, such as a reduced rate of admission with a serious bleed for patients on warfarin.[36,37] Despite this, drugs are prescribed with inadequate discussion,[38,39] with this likely contributing to the low adherence rates achieved by many patients.[40–42]

The application of the prescription charge in emergency departments in England is variable, and it is not surprising that physicians, who may have trained and worked in several hospitals, have varying approaches to this often controversial topic.[30]

Dispensing is a task that physicians are expected to do but are not trained to do. The role of the hidden curriculum has been explored in the sphere of undergraduate medical education,[43] with areas such as professionalism[44,45] and ethics[46,47] receiving particular attention. The 100-year anniversary of the Flexner report into postgraduate medical education in the United States has recently transferred attention on the curriculum in this area,[48,49] with a refocusing on preparing physicians to work safely and effectively ahead of encyclopedic scientific knowledge.[50] Seemingly simple tasks such as dispensing would be included in such a paradigm.

In the United States, clinical pharmacists have a role in the emergency department, and this often includes dispensing medication.[51] This may be an option in the United Kingdom, albeit one with considerable financial and human resource implications. It would, however, allow hospitals to meet recommendations from the Royal Pharmaceutical Society of Great Britain, stating that all dispensed medicinal products undergo an independent accuracy check by a pharmacist before being issued to a patient,[52] recommendations supported by guidance from the National Patient Safety Agency, United Kingdom.[53]

Despite this practice, in the United States, it seems that many prescriptions are dispensed from the emergency department without a pharmacy check and that insufficient retrospective review of drugs dispensed from the emergency department takes place.[54,55]

Safety culture and climate within health care have been extensively studied,[56,57] and work suggesting its link with dispensing accuracy in the pharmacy context[58,59] could be applied in the emergency department.

Strengths and Limitations of the Study

Being the first study of its kind in this area, the study has highlighted several areas for consideration and further study. It should encourage organizations to consider how they organize the dispensing of medications out of hours.

The size and the number of the focus groups are small, and this could be considered a weakness.[60] Focus group size was mainly dictated by convenience to the participants. It can be difficult to get junior physicians to give up their time to act as research participants. Even when several willing participants have been identified, their conflicting clinical commitments make it difficult to get them in the same room together. That said, the discussions seemed to reach saturation, so it is questionable whether larger or more groups would have added more pertinent information.[61] That is not to say that all possible themes were identified but that, within the context of an exploratory study, the aims achievable with this methodology, in the setting of the limited resources available, were achieved.

The participants represent a narrow selection of junior physicians within, at the time, 1 hospital. They were all motivated to participate despite the lack of remuneration, and this motivation may infer something about the participants that biases the data.

As a data collection tool, focus groups have their own inherent strengths and weaknesses. The major strength, and the reason for using them in this instance, is their dynamic nature and that the group discussion can yield information beyond the scope of predetermined questions developed by the researcher.[62] Weaknesses relevant to this study include that very dominant group members can overpower the discussion,[63] the conduction and analysis of focus groups are very labor intensive,[64] and there is a risk that consensus can be overemphasized, as outlined by Sim[65]: "an apparent conformity of view is an emergent property of group interaction, not a reflection of individual participants' opinions."

Thematic analysis is one of the most commonly used methods of qualitative analysis,[66] and one with which the lead researcher was familiar. This is important because the results are dependent on data collection[18] and analysis, and it is beneficial that both these steps be undertaken by the same person.[66]

The utility of triangulation in qualitative research is repeatedly documented,[67,68] and it is clear that, as a stand-alone project, this study does not achieve this. Data collection and analysis by a single researcher will have introduced bias.

The novel nature of the study has necessitated comparison with other studies from different fields or within different contexts. This may mean that works are not directly comparable; nevertheless, they provide some valuable insights.

CONCLUSIONS

It is clear that this study does not provide sufficient evidence to make firm policy recommendations; however, we believe that we have enough data to strongly encourage emergency departments to assess their practice as a matter of priority.

Locally improved training, reflecting what the participants in this study said, seems a sensible solution, in the interim at least. The other option, round-the-clock pharmacy services, is something that should be considered as acute care services are redesigned and redeveloped.

The possibility of a simple policy with regard to charging patients for drugs dispensed in the emergency department sounds appealing, but first, it would be important to know what hospitals are actually doing. A practice review of dispensing across a larger geographical area would hopefully provide further insight and some examples of good practice that can be shared.

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