

Optimum prescribing of discharge medicines: roles of hospital and community pharmacists

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Abstract

Aims

To develop and evaluate a new role for the ward pharmacist in communicating information about paediatric and neonatal discharge medicines to GPs and community pharmacists.

Design

Pre- and post-implementation questionnaire.

Subjects and setting

Parents, GPs and community pharmacists involved in the care of patients discharged from paediatric and neonatal wards in a district general hospital.

Results

The discharge process of 53 children (group 1) and the novel discharge process of 47 children (group 2) were evaluated. Response rates from GPs (57% and 60%) and community pharmacists (76% and 68%) in the two groups were comparable. Fewer parents replied in group 2 (43%) than in group 1 (60%). Community pharmacists identified 106 pharmaceutical care issues (PCIs) in the pre-intervention period compared with only 10 in the post-intervention period ($P < 0.001$). The GPs gave a significantly higher rating to the novel discharge process. Parents of 90% of group 1 children experienced 1 PCI on discharge (40% > 1) compared with 50% of parents of group 2 children (none > 1).

Conclusion

Introduction of the novel pharmacist-led discharge process improved delivery of pharmaceutical care and communication of drug-related issues to GPs and community pharmacists without a significant increase in the workload of the ward pharmacist.

Effective communication between secondary and primary care is essential for safe and successful prescribing of drug therapy after hospital discharge.^{1,2} Brief, immediate discharge notes are usually given to patients or carers to hand to their GPs informing them of the patient's main problems and discharge medicines. Full detailed hospital discharge summaries explaining the rationale and specific issues relating to prescribed treatment may take several weeks to reach the GP. No similar information is routinely given to community pharmacists or patients and their carers. The need for improved immediate communication between secondary and primary care, especially on treatment information and specific information on drug therapy, has been recognised.^{3,4} The need has also been demonstrated for doctors and pharmacists within secondary care to ensure that their primary care colleagues have an understanding of patients' treatment plans.^{5,6} Providing GPs and community pharmacists with specific information on drug formulation, supply, dosage changes, titration, monitoring needs or discontinuation plans on the immediate discharge summaries would help smooth the transition from secondary to primary care. It is conceivable that the lack of such information may lead to inappropriate prescribing, change of formulation or unintentional discontinuation of treatment.⁷

All patients admitted to any hospital department are likely to benefit from improved channels of communication between hospital doctors and their colleagues in the community. The elderly, children and patients with mental health disorders might stand to benefit most because drug formulation and licence status can cause anxiety to GPs and community pharmacists.

A pilot study of a novel pharmacist-led discharge process was therefore designed to facilitate transfer of information to both the community pharmacist and the GP. It was believed that paediatric patients might be ideal candidates for such a project for several reasons:

- The current changes in paediatric practice mean that more ill children are being looked after in the community under the supervision of the primary care team, with treatment initiated at hospital-based ambulatory care units or after short hospital admissions
- An increasing number of children with chronic illnesses, on multiple medications,

are admitted intermittently for short periods to revise or initiate treatment

- Off-licence or off-label prescriptions are common in paediatrics
- Many children are prescribed special formulations to enable ease of administration via the oral route or via nasogastric or gastrostomy tubes
- The parents of ill children are usually young, healthy and motivated to adhere to prescription advice

Methods

Pharmaceutical care issues (PCIs) are defined for the purpose of this study as any actual or perceived difficulties in the process of obtaining and dispensing medicines, including the choice of formulation, dosages, length of treatment and possible interactions with other medicines. The following steps were taken to identify the relevant PCIs for paediatric discharges:

- A focus group of clinical staff was established, consisting of a consultant paediatrician, a GP, a community pharmacist, a paediatric clinical ward manager, paediatric/neonatal liaison nurses and hospital specialist paediatric pharmacists
- Parents of recently discharged children were interviewed on the ward to obtain their views on the major issues relating to the discharge medicines
- The views of all 64 registered community pharmacists in the Forth Valley Health Board area were sought via a postal questionnaire

Based on the above information, three questionnaires were developed to assess the views of parents, GPs and community pharmacists before any intervention and later after implementation of the novel discharge process (post-intervention). The questionnaires were designed to obtain maximum analysable data using closed questions, and were supplemented with a small number of open questions for comments or additional issues. The questionnaires were validated on representative samples of five GPs, five pharmacists and the parents of five children before the start of the pilot study.

The first part of the study (pre-intervention) was carried out over a period of four weeks, during which 100 to 120 discharges were expected. The three questionnaires were given to the parents of all children regardless of the number of medicines prescribed on discharge. One questionnaire was designed

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for the parents to complete, one to be handed to the GP with the discharge letter and one to be handed to the community pharmacist from whom the family usually obtain their medicines (ie, the nominated community pharmacist). Stamped addressed envelopes were provided for the return of completed questionnaires in confidence.

The second part of the study (post-intervention) was also carried out over a four-week period, when similar questionnaires were sent to evaluate the pharmacist-led discharge process. The paediatric pharmacist is a full-time member of the clinical team and monitors prescribed medicines for inpatient use and for discharge. The pharmacist transcribed the signed inpatient medical prescription on the ward, without the need for the doctors to re-sign it (in accordance with the Royal Pharmaceutical Society's code of ethics).⁸ This new medication discharge summary included information on drug formulation, supply, dosage changes, licence status, titration, monitoring needs or discontinuation plans. The inpatient pharmacy profile was also incorporated on the reverse of the clinical pharmacist's copy of the form where any issues relevant to the patient's stay could be documented. Copies were also retained in the clinical pharmacist's records, the dispensary and the patient's case notes. Medicines to take home were dispensed from the inpatient medical prescription on the ward. The pharmacist also provided verbal counselling to each parent or carer on any new medicines, and asked them to take the documentation promptly to their GP and community pharmacist. The usual immediate discharge summary containing clinical information was made in duplicate (for the patient's medical case notes and the GP) but was not sent to the community pharmacist in order to avoid giving unnecessary confidential clinical information.

All children discharged from the paediatric ward or the neonatal unit between 9am and 5pm during weekdays, who required a repeat prescription of one or more medicines, were eligible for inclusion. Patients were only excluded from the study if they were discharged without being screened by the pharmacist, if the parents were unable to nominate a community pharmacist, if patients were given a full course of discharge medicines from the hospital and did not need a repeat prescription or if consent was refused.

The data were handled and processed on the SPSS version 9.0 statistical programme. Chi-squared and Mann-Whitney U tests were used for statistical analysis. The local ethics committee approved the project.

Results

Pharmaceutical care issues The focus group and the parents identified three areas as being important indicators of effective discharge plans: communication between professionals, education of patients and their families and specific therapeutic management

Panel 1: Main pharmaceutical care issues (PCIs)

(A) Communication of information between professionals

Informing GP of:

- Changes in medication
- Changes in dosages
- Any unusual routes of administration
- Any unusual formulations
- Any new medicines prescribed
- Necessary monitoring to be undertaken
- Necessary follow-up to be undertaken
- Any discontinued medicines
- Length of therapy

Informing community pharmacist of:

- Length of therapy
- Any discontinued medicines
- Any changes in medicine dose
- Reasons for medicines
- Unusual suppliers
- Any unusual routes of administration
- Any unusual formulations

(B) Pharmaceutical care issues relating to patient education

Informing patients or parents about:

- The reasons for medicines
- The length of therapy
- The equivalent doses/volumes of liquids
- Any changes to medicines/dose changes
- Inhaler technique
- Intravenous antibiotics
- Self-monitoring of condition, eg, peak flow
- Unlicensed medicines (where appropriate)
- Self medicating with over-the-counter products
- Any unusual treatment regimens

(C) Pharmaceutical care issues relating to therapeutic management

- Appropriate drug monitoring
- Appropriate patient monitoring
- Intolerance and allergies
- Interactions with medicine and feeds
- Necessary follow up

issues (Panel 1). Forty out of 64 community pharmacists replied and all of them expressed the need for the following information through a discharge summary: drug formulation, supply, license status, dosage information, route of administration, length of treatment, delivery devices, equipment, intolerance, allergy and discontinued medications.

Ward pharmacist's workload The pharmacist was able to process 100 discharges over the total period of 40 working days during the two arms of the study (eight weeks), with a mean of 2.5 discharges per day. Each discharge process was completed within 15 to 20 minutes, including verbal counselling of the child and the parents.

Pre-intervention questionnaires

(group 1) A total of 112 children were discharged from the children's ward and the neonatal unit. Fifty-three children (47 per cent) fulfilled the criteria for inclusion in the

study and their parents were given the appropriate questionnaires. Replies were received from 40 community pharmacists (75.5 per cent), 32 parents (60.4 per cent) and 30 GPs (56.6 per cent).

Post-intervention questionnaires (group 2)

A total of 133 children were discharged from the children's ward and the neonatal unit. Forty-seven children (35 per cent) fulfilled the criteria for inclusion and their parents were given the appropriate questionnaires. Replies were received from 32 community pharmacists (68.1 per cent), 20 parents (42.6 per cent) and 28 GPs (59.6 per cent).

Both groups of patients were similar in clinical and social case-mix and had no statistical differences in mean age (range), sex distribution, length of stay, ward of admission, mean number of drugs on admission or discharge (Table 1) and mean number of potential pharmaceutical care issues. The potential

Table 1: Patient demographics

Demographic	Pre-intervention (n=53)	Post-intervention (n=47)	P-value
Age in years: median (IQR*)	5 (2,6)	6 (2,10)	$P>0.05$
Female sex: number (%)	19 (35.8)	15 (31.9)	$\chi^2=0.172$ $P>0.05$
Length of stay in days: median (IQR)	1 (1,2)	1 (1,2)	$P>0.05$
Number of drugs on admission: median (IQR)	0 (0,1)	1 (0,2)	$P<0.05$
Number of drugs on discharge: median (IQR)	2 (1,3)	2 (2,3)	$P>0.05$
Admission to paediatric ward: number (%)	50 (94.3)	45 (95.7)	$\chi^2=0.104$ $P>0.05$

Note: the interquartile range (IQR) is expressed as the 25th and 75th percentiles

Table 2: Actual pharmaceutical care issues identified by community pharmacists

Medication related issues	Pre-intervention (n=40)	Post-intervention (n=32)	P-value
Formulation	14	1	<0.001
Supply	10	2	<0.05
Unlicensed use	13	0	<0.001
Dosage information	3	0	NS
Reason for medicine	1	1	NS
Route of administration	13	0	<0.05
Length of treatment	10	5	NS
Delivery device	5	0	NS
Extra equipment	6	1	<0.05
Intolerance or allergy	15	0	<0.001
Discontinued medicines	16	0	<0.001
Total	106	10	

Table 3: GPs' median (inter-quartile range*) valuation of novel discharge process (1 = poor, 5 = excellent)

	Pre-intervention (n=30)	Post-intervention (n=28)	P-value
Overall quality	3 (2, 4)	4 (4, 4)	$P<0.001$
Discontinued medicines	1 (1, 2)	4 (4, 4)	$P<0.05$
Dose adjustments	2 (1, 4)	4 (4, 4)	$P<0.05$
Unlicensed medicines	1 (1, 1)	4 (4, 4)	$P<0.001$
Drug monitoring	1 (1, 1.75)	4 (4, 4)	$P<0.001$
Length of therapy	3 (1, 4)	4 (3, 5)	$P<0.05$
Hospital diagnosis	4 (3, 4)	5 (4, 5)	$P<0.001$
Hospital investigations	3 (1, 4)	4 (3, 4)	NS
Patient monitoring	3 (1, 3.5)	4 (3, 4)	NS
Allergy/intolerance	3 (2, 3)	4 (2, 5)	NS
Follow-up	3 (1, 4)	4 (1, 5)	NS

Note: the interquartile range (IQR) is expressed as the 25th and 75th percentiles

pharmaceutical care issues were identified through the focus groups.

Responses from community pharmacists

Two-thirds of parents delivered the discharge summary to community pharmacists within one week and 106 actual care issues (Table 2) were identified in the pre-intervention group and 10 in the post-intervention group ($P<0.001$). Fifteen of the 20 community pharmacists that had the facility of patient medication records were able to include the information to aid delivery of pharmaceutical care.

Responses from general practitioners

In both groups, 60 per cent of parents delivered the discharge letter to their GPs within one week. The GPs rated the novel discharge

process higher than the pre-intervention discharge summary (Table 3).

Responses from parents Parents in the post-intervention group reported marked reductions in the number of pharmaceutical care issues compared with those in the pre-intervention group. Although, the differences were not statistically significant (Table 4), 90 per cent of parents experienced one PCI pre-intervention (40 per cent had more than one issue) compared with 50 per cent post-intervention (none had more than one issue).

Discussion

This study has identified specific pharmaceutical care issues in paediatric patients. Several of the issues identified in the pre-intervention questionnaire were amenable to change and

Table 4: Information received by parents or carers

No information was received on:	Pre-intervention (n=32)	Post-intervention (n=20)
Medicines provided		
on discharge	2	0
Reason for medicine	4	0
Side effects	16	10
Length of therapy	5	0
How to give medicine	2	0
Changes to medicine	5	0

improvement upon implementation of the novel pharmacist-led discharge process. There was a high level of agreement among parents, GPs and community pharmacists on the improved discharge information. The overall result was a significant reduction in the number of potential pharmaceutical care issues that became actual issues from 106 before to 10 after the intervention.

Communication with GPs via this discharge process has taken patients' care several steps forwards. The GPs not only received information on the disease process and the management strategies, but also a detailed account of the nature, quality and possible problems associated with their patients' medicines. GPs rated highly the quality of information given to them about their patients' medicines. Many medicines are prescribed off licence or off label in paediatrics, which can cause concern to GPs and might lead them to be hesitant in prescribing repeat medicines.^{9,10}

Previous work has focused on the quality and timing of information sent to GPs and community pharmacists in adults but not in paediatrics.¹⁻⁷ Paediatric pharmaceutical care issues on discharge from hospital have not previously been reported in the literature. Nor has the impact of formal communication to community pharmacists been previously evaluated in terms of reduced pharmaceutical care issues that affect the patient on discharge from hospital. For the first time community pharmacists have been formally included in the discharge process of paediatric patients. The project seems to have raised parents' awareness of the role of community pharmacists in their children's care. It has previously been perceived that patients did not regularly use the same community pharmacy but this project highlights that parents were able readily to identify a nominated community pharmacist. Parents were also responsible for taking the documentation to their pharmacy to avoid problems with them visiting another pharmacy. The community pharmacists showed great satisfaction in almost all their responses to the new discharge process, as they become active members of the medical care team.

The new process redesigned the workload of the ward pharmacist since the discharge summary also incorporated an inpatient pro-

file section to avoid duplication of effort in writing current medicines and relevant issues on a separate document.

The new discharge process has not resulted in any additional cost for the health care system. There was no cost to send out the discharge summary since the parents or carers were responsible for its delivery. It made better use of the paediatric pharmacist's time on the ward and within the clinical team. It is arguable that extending the process to cover larger clinical areas may involve further investment. However, the benefit of ensuring safe and efficient transfer of drug information may justify the cost. Future improvements in information technology and the development of electronic prescribing may further reduce costs. Electronic transfer of information would be better suited to patients being registered with one pharmacy for consistent transfer of information.

The new discharge process was restricted to normal weekday working hours during the pilot study, however, it would be feasible for the ward pharmacist to extend the service to out-of-hours discharges in the future. Information could be posted to GPs, community pharmacists and parents as soon as possible after discharge, but parents would need to provide the name and address of their nominated community pharmacist on admission.

From the hospital care point of view, this process has taken some responsibilities for communication to primary care away from junior medical staff and ensured accurate communication of medication issues to primary care. The impact of this process on junior doctors' workload was not formally assessed and quantified and future work is needed to determine the potential for allowing junior doctors the time to deal with other clinical issues.

Other patient groups, such as the elderly and those on multiple treatments, may have greater pharmaceutical care issues on hospital discharge. This novel pharmacist-led discharge process may therefore have a wider role to play for other patient groups in the health service.

Larger studies that include other groups of patients are necessary to determine the consistency of the benefits in a cost-effective manner.

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