Does a dedicated discharge coordinator improve the quality of hospital discharge?

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Abstract

Objective—To evaluate the effectiveness of the role of a discharge coordinator whose sole responsibility was to plan and coordinate the discharge of patients from medical wards.

Design—An intervention study in which the quality of discharge planning was assessed before and after the introduction of a discharge coordinator. Patients were interviewed on the ward before discharge and seven to 10 days after being discharged home.

Setting—The three medical wards at the Homerton Hospital in Hackney, east London.

Patients—600 randomly sampled adult patients admitted to the medical wards of the study hospital, who were resident in the district (but not in institutions), were under the care of physicians (excluding psychiatry), and were discharged home from one of the medical wards. The sampling was conducted in three study phases, over 18 months.

Interventions—Phase I comprised baseline data collection; in phase II data were collected after the introduction of the district discharge planning policy and a discharge form (checklist) for all patients; in phase III data were collected after the introduction of the discharge coordinator.

Main measures—The quality and outcome of discharge planning. Readmission rates, duration of stay, appropriateness of days of care, patients' health and satisfaction, problems after discharge, and receipt of services.

Results—The discharge coordinator resulted in an improved discharge planning process, and there was a reduction in problems experienced by patients after discharge, and in perceived need for medical and healthcare services. There was no evidence that the discharge coordinator resulted in a more timely or effective provision of community services after discharge, or that the appropriateness or efficiency of bed use was improved.

Conclusions—The introduction of a discharge coordinator improved the quality of discharge planning, but at additional cost.

(*Quality in Health Care* 1996;5:89-96)

Keywords: discharge coordinator

is crucial for good quality inpatient care and timely discharge from hospital. Good quality hospital discharge can be defined as patient satisfaction with involvement in the process of discharge, the absence of problems after discharge and the assessment, documentation, and meeting of the need for community care after discharge.

A recent report from the National Health Service (NHS) Executive recommended that discharge coordinators should be appointed in hospitals to facilitate discharge planning.¹ An effective discharge planning process may be described as the construction and implementation of a planned programme of continuing care which meets a patient's needs after discharge from hospital. An adequate system of assessing patients' needs should also maximise the efficient use of hospital beds by ensuring that patients are not in hospital for an inappropriate time, or discharged with inadequate notice for the organisation of their continuing care at home. Essential elements of effective discharge planning are a multi-disciplinary approach, early and coordinated assessment of a patient's needs and home circumstances, early planning of needs for further care, and effective communication. There is some evidence that the strict application of criteria for inpatient stays, reviewed daily by medical staff for each patient, can reduce the duration of stay.²

Although the NHS Executive recommended the appointment of discharge coordinators, there are few supportive publications on the need for the employment of additional professionals to facilitate discharge. The information on the process of discharge and on discharge planning is mainly descriptive,^{3,4} although one quantitative study has recently been published.⁵ In general, the publications concentrate on people aged over 60 – an important group in view of their greater needs for aftercare from health and social services and their higher risk of readmission.⁶ Apart from elderly people, other groups at risk of readmission are those with chronic illnesses and those who have had two or more surgical procedures performed during the original admission.⁷ Social circumstances are poor predictors of risk of readmission.^{6,7} A review of the earlier publications from the United Kingdom showed that thorough preparation of the patient for discharge and discharge planning seemed to be rare; patients were discharged before their community services had been mobilised and there was often inadequate notice of discharge for the patient.⁸ According to a recent review of the situation in Britain,

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Accepted for publication 22 January 1996

Effective communication between professionals at the primary-secondary care interface

little has changed since.⁹ A review of discharge planning in the United States reported that several untested assumptions underlay approaches to discharge planning, including that it is more effective with interdisciplinary input and a designated professional who assumes primary responsibility for coordinating the discharge plan. This was shown by one of the few evaluative studies, conducted by Mamon *et al.*¹⁰ They studied 919 admissions of people aged 60 and over to five hospitals in the United States. Patients were interviewed two weeks after discharge. They reported that only when a formal discharge planning case manager was involved in the discharge was there a significant reduction in unmet treatment needs. The results of a recent randomised trial from the United States reported that a discharge planning intervention resulted in fewer readmissions, fewer total days in hospital, lower readmission charges, and lower charges for the healthcare services after discharge.⁵

In the United States, discharge planning has been in operation since the introduction of the prospective payment system (PPS) which has been in effect in most states since 1983. In Britain, the introduction of the NHS and Community Care Act 1990 in April 1993 brought about changes in responsibility and referral practices for managed care in the community.¹¹ Also, Department of Health guidelines on the discharge of patients from hospital,¹² a fuller workbook,¹³ and the introduction of the *Patient's Charter*¹⁴ have all focused attention on the need to develop and initiate discharge plans that are appropriate, adequate, based on need, and cost effective. This has been given impetus by the proposed changes in the primary-secondary care interface, particularly in London.¹⁵⁻¹⁸ As more importance is placed on the significance of planning a quality service that reflects the needs of consumers as well as providers and purchasers, it becomes increasingly necessary to evaluate the effectiveness of discharge planning in the United Kingdom.

Our aim, therefore, was to evaluate the effectiveness of: (a) the implementation of a discharge planning policy; and (b) the role of a discharge coordinator whose sole responsibility was to plan and coordinate the discharge of patients from medical wards. The hypothesis was that such a person would improve the quality of discharge planning and increase the efficiency of bed use compared with that achieved under the existing multidisciplinary arrangements.

Study, design, subjects, and methods

The study was conducted on all three medical wards at the Homerton Hospital in east London. An intervention study was designed which was carried out in three consecutive phases over a period of 18 months. Phase I (three months) just preceded the introduction of a district's discharge planning policy by nurse managers¹⁹ and provided baseline data. During this phase there were no formalised ward arrangements for discharge planning. Phase II (next three months) was carried out

once the policy had had time to take effect and included the introduction, with the agreement of nurse managers, of a discharge planning checklist, which was to form the basis of the discharge coordinator's planning process – for example, services received before the admission which need restarting; new services needed; functional ability; medication. The policy was simply a restatement of good practice but without giving any one professional responsibility for planning the discharge. It was important that the checklist was introduced at this point so that any improvements occurring as a result of a newly imposed structure on the discharge planning process could be distinguished from those occurring due to the discharge coordinator. Phase III (three months) immediately followed the introduction of the discharge coordinator who had responsibility for assessing patients' needs before discharge (according to the checklist) and to act as coordinator to mobilise services when other staff had not done so. The discharge coordinator was an experienced and fully qualified ward nurse, who was briefed by the research team on her role (based on earlier publications).

The discharge coordinator's role was to make an initial assessment of each patient's needs, to liaise with medical and nursing staff about discharge, ensuring assessment by other healthcare staff and social workers when necessary, to liaise with community services and general practitioners, and to attend ward discharge meetings. During her induction meeting she met all nursing, medical, and other healthcare staff on the participating wards, and with relevant community staff. General practitioners (GPs) were consulted about her new role. The discharge coordinator was entirely hospital based.

All patients admitted to the medical wards at the Homerton hospital were eligible for inclusion providing that they were resident within the boundaries of the local health authority; had not been admitted from an institution; were 18 years of age or older; were under the care of physicians (excluding psychiatrists); and were discharged home from one of the medical wards. Data were collected from patients and their medical records before and after discharge. The aim was to obtain 200 patient responders at each phase. To ensure that sufficient numbers were recruited, patients were initially over sampled to allow exclusion of patients who did not satisfy the sampling criteria (those who transferred to surgical wards) and who did not respond (due to deaths, moves outside the area, refusals). Sampling involved randomly recruiting every third patient who arrived on the wards, in strict chronological order. The sampling and interviewing on the wards and in patients' homes were carried out by a trained researcher, with the help of two interviewers. Two questionnaires were given to each patient, one when the patient was in hospital, and one seven to 10 days after discharge. The questionnaires covered sociodemographic characteristics, health and functional ability, community

services needed and received (before admission and after discharge), other discharge needs, patients' knowledge and understanding of their condition and treatment, and patients' satisfaction with the discharge process. These items were taken from previous survey questions developed by us. Information was collected from patients' medical and nursing notes on the last day of care, on the reasons for the admission, and on records of assessment of discharge needs and action taken (dichotomised codings of recorded or not recorded for performance of key activities of daily living, need for health and social services, communication with key people for transportation and care after discharge, lay and medical care, communication with the patient about after-care, and medication). The information required was on procedures and needs, and when discharge needs were not recorded in patients' notes this was coded as such and used as a variable in the evaluation. The questionnaire was based on a literature review of relevant studies, and on previously developed questions.⁷ The questionnaires used were structured in design, with space for any comments.

Most patients completed several questions that measured health status, which were only used to check on any differences in the health of patients which might affect the study results, and to see if the discharge coordinator affected the outcome (she did not). The measurement scales used included the abbreviated mental test,^{20, 21} the Barthel index,²² the RAND SF-36,²³ the RAND short depression screener,²⁴ the affect balance scale,²⁵ and the appropriateness evaluation protocol.²⁶ Detailed results from these scales are documented in the report of the study, available from the authors.²⁷ Analyses were carried out with SPSS software, and the tests for significance were χ^2 (all two tailed).

Differences reported in this paper were significant, unless otherwise stated. The minimum level of significance taken was $P < 0.05$, although most levels were $P < 0.001$. The results from each phase are reported separately (there were no differences between the phases for sociodemographic data). Totals do not always equal 626 due to non-response of single items.

Results

A sample of 600 patients was aimed for. The basis for calculating statistical power is as follows:

With 95% confidence and 80% power, with expected patient satisfaction levels of 75%, a sample size of 200 in each group should detect a change of 17%. If the initial patient satisfaction level was 70% then 200 in each group would detect an increase of 14%. A 15% increase in patient satisfaction, assuming phase I levels of satisfaction to be 75%, would require two groups of 162. If we assume an SD of 10 and assuming normality in data on duration of stay, then 200 in each group would detect a difference of three days.

A complete set of information was obtained for a total of 626 patients, 215 in phase I, 204 in phase II and 207 in phase III.

PATIENTS

There were no differences between the phases in sociodemographic characteristics, overall health status, or use of services by the patients before admission. Of the sample 307(52%) were women; 479(77%) were aged 55 or over; 280(45%) were married or cohabiting; 360(59%) were white European, and 130(21%) were black (African, Caribbean, or British); 363(59%) lived in council owned accommodation; 228(38%) lived alone; 166(25%) were in paid work; 76(13%) were in socioeconomic groupings I or II, 92(15%) in III non-manual, 207(34%) in III manual, 193(32%) in IV and V, and 37(6%) were in other categories; 154(25%) had received some further education.

CURRENT ADMISSION

Of the patients studied 569(91%) were admitted as emergencies. They were under the care of 11 consultants, with 70% under the care of four of these. They were almost equally divided between the three medical wards. In phase I 74(35%) patients, in phase II 72(36%), and in phase III 84(42%) had been previously admitted to medical wards within the past year. For 31(48%) of these in phase I, 30(46%) in phase II, and 31(38%) in phase III, the reason for that admission was not related to the current admission.

APPROPRIATENESS OF ADMISSION AND DAYS OF CARE

The appropriateness evaluation protocol²⁶ was used to assess appropriateness of admission for a sample of the patients. For the current admission, 131(74%) in phase I, 141(70%) in phase II, and 125(64%) in phase III were assessed as appropriately admitted. Of the inappropriate cases, 16(8%), 12(20%), and 21(29%) in phases I, II, and III could have been cared for at home, 8(24%), 8(13%), and 7(10%) as outpatients, and 18(29%), 40(67%), and 44(61%) in a non-acute bed. There were no associations between appropriateness of admission and health status. Appropriateness of days of care (assessed during the full 24 hours preceding the day of discharge) varied from 50(29%) in phase I, 85(42%) in phase II, and 50(29%) in phase III. There were no significant differences in appropriateness between the phases (of either admission or days of care).

DURATION OF STAY

The mean (SD, median) duration of stay for phase I was 10.55(11.35, 6), for phase II it declined to 7.89(8.36, 6), but for phase III it increased to 13.52(37.78, 7.00). The differences between means for phases I and II and II and III were significant (two tailed t test 2.61, $P < 0.01$ for phase I and II; two tailed t test 2.05, $P < 0.05$ for phases II and III; differences between phases I and III were not significant). An examination of durations of stay for all patients (including non-study patients) admitted to medical wards at Homerton during the same period showed no such difference between the phases.

DISCHARGE PLANNING PROCESS

There were no differences between the three groups in how much notice they had been given of their discharge, their views on their duration of stay, how much information they had on their illness, and medication before they were discharged. In phase I 45(23%), in phase II 61(31%), and in phase III 51(25%) had less than six hours or no notice of their discharge, but 175(88%) in phase I, 178(90%) in phase II, and 186(91%) in phase III said that they had enough time to make their arrangements. Between 34(17%) in phase I, 41(21%) in phase II, and 41(20%) in phase III thought that their duration of stay was too short. In the three phases 173(85%), 172(86%), and 189(89%) said that they would have liked more information about their discharge, for most, on their medical condition. In phases II (160(80%)) and III (153(74%)) patients were less likely to have been given a discharge date than patients in phase I (187(93%)), but patients in phase III (140(91%)) were significantly more likely to have been discharged on that date than in phases I (143(76%)) and II (126(82%)) (tables 1 and 2). There were no differences with age. Of the patients in phase III 130(64%) were asked in detail about their home circumstances compared with 74(36%), and 77(40%) in phases I and II (χ^2 17.08; $P < 0.001$). Patients in phase III were twice as likely to have been visited by a social worker in hospital than the patients in the other two groups – 62(30%) patients in phase III com-

pared with 31(15%) and 27(14%) patients in phases I and II (χ^2 10.17; $P < 0.01$). In phases I and II, 11(12%) and 13(15%) said that they were able to discuss their anxieties about discharge and aftercare with a member of staff in hospital who was rated as helpful; this increased to 49(88%) at phase III (χ^2 41.91; $P < 0.001$).

A checklist or clear discharge plan was more likely to have been used in each successive phase (table 3). Patients in phase III were more likely to have documentation about their care arrangements in the hospital records than patients in either of the other two phases (table 3). In phases I, II, and III, 156(75%), 159(81%), and 172(84%) patients said that they had been given a discharge letter to give to their GPs, showing a significant increase between phases I to III – the whole period of the study (phase I and III χ^2 6.80; $P < 0.01$).

FUNCTIONAL ABILITY, INFORMAL SUPPORT, AND HEALTH

There were no differences between the phases in the overall mental or physical health or functional ability of patients at follow up.²⁰⁻²⁵ Most were functionally able. Long term feelings of depression and negative moods were evident with both the RAND scales and the affect balance scale. Altogether 63(32%) patients in phase I, 64(33%) in phase II, and 70(36%) in phase III said, in response to a RAND depression screening item, that they felt depressed or sad most days in the past two years.

PROFESSIONAL SERVICES RECEIVED AND PROBLEMS ENCOUNTERED

Only 4(2%) patients in phase III had problems with hospital transport on discharge, in comparison with 5(10%) patients in phase II, and 17(17%) patients in phase I (phases I and II χ^2 9.34; $P < 0.01$; phases II and III χ^2 1.31; non-significant; phases I and III χ^2 7.65; $P < 0.01$).

Patients in phase III were significantly less likely to have been visited by a GP since discharge (1(1%)) than patients in either phase II (10(6%)) or phase I (39(20%)) (phases I and II, χ^2 19.33; $P < 0.001$; phases II and III χ^2 7.91; $P < 0.01$; phases I and III χ^2 37.99; $P < 0.001$). There was little difference between phases in the receipt of other services. Patients were asked if the health and social services professionals allocated had arrived when

Table 1 Data on discharge date given

Were you given a definite discharge date?	Phase I n(%)	Phase II n(%)	Phase III n(%)
Yes	187(93)	160(80)	153(74)
No	15(7)	39(20)	53(26)
Total	202	99	206

Overall χ^2 24.32; $P < 0.001$.
Linear trend χ^2 23.48; $P < 0.0001$.
Departure from linear trend χ^2 0.84; $P = 0.36$.
Subscripted numbers are degrees of freedom.

Table 2 Data on actual discharge date

If yes, was this the date you were actually discharged?	Phase I n(%)	Phase II n(%)	Phase III n(%)
Yes	143(76)	126(82)	140(91)
No	44(24)	27(18)	14(9)
Total	187	153	154

Overall χ^2 12.39; $P < 0.01$.
Linear trend χ^2 12.26; $P < 0.0005$.
Departure from linear trend χ^2 0.13; $P = 0.72$.
Subscripted numbers are degrees of freedom.

Table 3 Data on discharge plan or check list and documentation of arrangements for aftercare

	Has a discharge plan or checklist been used?			Have arrangements for after care been documented by staff?		
	Phase I n(%)	Phase II n(%)	Phase III n(%)	Phase I n(%)	Phase II n(%)	Phase III n(%)
Yes	2(1)	124(62)	203(99)	37(19)	40(20)	81(40)
No	199(99)	77(38)	3(1)	162(81)	160(80)	124(60)
Total	201	201	206	199	200	205

Discharge plan used:
Overall χ^2 = 396.8; $P < 0.001$.
Linear trend χ^2 389.11; $P < 0.0001$.
Departure from linear trend χ^2 7.7; $P = 0.0055$.
Arrangements made:
Overall χ^2 28.75; $P < 0.001$.
Linear trend χ^2 23.07; $P < 0.0001$.
Departure from linear trend χ^2 5.68; $P = 0.0172$.

Table 4 Data on aftercare services

For those expecting services, did they arrive on the day expected?	n(%)
General practitioner:	
Yes	27(63)
No, late	11(26)
Not arrived yet	4(9)
No, early	1(2)
District nurse:	
Yes	18(30)
No, late	33(55)
Not arrived yet	5(8)
No, early	4(7)
Meals on wheels:	
Yes	9(53)
No, late	6(35)
Not arrived yet	2(12)
No, early	0(0)
Home help:	
Yes	30(51)
No, late	21(36)
Not arrived yet	3(5)
No, early	5(8)
Number of respondents	17-60

expected. Table 4 shows that most GPs arrived on the day they were expected, 26% arrived on a day later than this, and 9% had not arrived; just 30% of district nurses and 53% of meals on wheels arrived when expected. There were no differences between phases, and the discharge coordinator had not led to any improvements in the speed with which services were (re)started.

PROBLEMS AFTER DISCHARGE

Patients in phase III were less likely than those in phases I and II to have failed to receive any prescribed treatment or care (table 5). Fewer patients in phase III (26(13%)) than in phases I (58(28%)) and II (45(23%)) reported experiencing complications from their treatment in hospital which hospital staff did not warn them about (phase I and II = χ^2 1.88; non-significant; phases II and III = χ^2 7.38; $P < 0.01$; phases I and III = χ^2 16.59; $P < 0.001$). Patients in phases II (114(59%)) and III (125(63%)) were significantly less likely to have reported the need to see the hospital doctor again than patients in phase I (159(78%)) (phases I and II = χ^2 16.30; $P < 0.001$; phases II and III = χ^2 0.90, not

Table 5 Problems experienced after discharge

Problem	Phase I n(%)	Phase II n(%)	Phase III n(%)
Patient failed to receive treatment care or prescribed medication that the hospital staff advised him or her to get:*			
No	173(85)	172(89)	197(96)
Yes	30(15)	21(11)	9(4)
Patient experienced problems or complications arising from treatment in hospital which staff did not warn about:†			
Yes	58(28)	45(23)	26(13)
No	142(72)	151(77)	180(87)
Patient felt the need to see the hospital doctor again:‡			
Yes	159(78)	114(59)	125(63)
No	46(22)	80(41)	72(36)
Number of respondents	200-205	193-196	197-206

*Overall χ^2 12.61; $P < 0.01$.

Linear trend χ^2 12.36; $P < 0.0004$.

Departure from linear trend χ^2 0.25; $P = 0.62$.

†Overall χ^2 16.57; $P < 0.001$.

Linear trend χ^2 16.21; $P < 0.0001$.

Departure from linear trend χ^2 0.36; $P = 0.55$.

‡Overall χ^2 17.34; $P < 0.001$.

Linear trend χ^2 9.21; $P < 0.0002$.

Departure from linear trend χ^2 8.13; $P = 0.004$.

Subscripted numbers are degrees of freedom.

significant; phases I and III = χ^2 9.64, $P < 0.01$).

PATIENT SATISFACTION

In phase I 153(76%) respondents, in phase II 155(84%), and in phase III 186(90%) reported that they were very satisfied or satisfied with the arrangements made for their discharge. This increase in patient satisfaction about discharge was significant between phases I and III (χ^2 8.46; $P < 0.01$), not between II to III (χ^2 0.49; non-significant), and between I and III (χ^2 14.01; $P < 0.001$). There was a similar trend in patients' reports of their carers' satisfaction, although this did not reach significance.

READMISSION RATES

There were no significant differences in readmission rates (within seven days of discharge) between the three phases. For phases I, II, and III the readmission rates were 18(9%), 21(11%), and 15(7%), and eight of these people had been readmitted more than once. Readmission rates within 28 days of discharge for all patients during the same periods dropped from 2.6% in phase I, to 2.1% in phase II, and 1.7% in phase III.

Discussion

Good quality hospital discharge can be defined in relation to timely discharge, patient satisfaction with the process of discharge and communication about it, the absence of problems after discharge, and the assessment, documentation, and meeting of need for community care from health or social services after discharge.

The results of this study indicate that the employment of a discharge coordinator results in an improved discharge planning process, and reduces patients' problems after discharge. However, the discharge coordinator had no impact on the more timely or effective provision of community services after discharge, and did not improve the appropriateness or efficiency of bed use.

On the positive side, patients in phase III were significantly more likely to have been asked about their home circumstances while they were in hospital than those in either of the other two phases and they were twice as likely to have been visited by a social worker. They were also three times as likely to have reported that they were able to discuss their anxieties about their discharge with a member of staff, and significantly more likely to have had documentation about their arrangements after discharge in the medical notes. For all these factors, there was no significant difference between phases I and II, which strongly suggests that improvements were due specifically to the discharge coordinator, rather than improvements in discharge planning generally. On the other hand, there were some areas in which improvements took place gradually over the whole period of the study or in which the main improvements took place between phases I and II. For example, there was a significant decrease between all the phases in the proportion of patients who had been visited

by their GP in the period after discharge and a decrease in the proportion of patients who said that they felt the need to see the hospital doctor again. These findings are reflected in the lower proportion of the patients in phase III reporting problems relating to their admission that they had not been warned about, and reporting failure to receive prescribed treatment or care. Although these factors showed a trend over the three phases, the significant differences occurred between phases II and III, rather than I and II.

There are therefore two sets of effects that need to be disentangled. Firstly we must distinguish between those improvements occurring as a result of improved discharge planning after the implementation of the local policy and those occurring as a result of the introduction of the discharge coordinator. Secondly, it is important to distinguish between those areas in which the discharge coordinator seemed to be effective and those in which she did not.

For changes in discharge planning, there is no doubt that there were some general improvements over the whole period of the study which were probably due to a combination of the implementation of the local policy developed jointly by those working in health and social services, the introduction of the discharge checklists, and a general increase in awareness about discharge planning caused by the study itself. However, it is clear that the greatest improvement occurred after the introduction of the discharge coordinator, strongly suggesting that this post had a beneficial effect. This effect, however, was not universal, but seemed to be confined to those matters concerning the medical welfare of the patient and the successful arrangement of medical and other – for example transport – services that are usually the responsibility of ward staff. The discharge coordinator seemed to have little effect on the efficiency with which community services were provided or whether they were provided at all. This highlights the limitations of such a post, and shows that for discharge planning to be successful it has to be combined with the adequate provision of effectively organised community services.

An effect essential to make the idea of a discharge coordinator appeal to NHS managers is an increase in efficiency of use of hospital beds. To assess the extent to which this was a reality, we considered three indicators of efficiency: duration of stay, appropriateness of the day preceding discharge as assessed by the appropriateness evaluation protocol,²⁶ and readmission rates.

For duration of stay, the introduction of the discharge coordinator was actually associated with an increase. A problem caused by the longitudinal design of this study is that it is not always possible to conclude that any changes that occurred did so as a result of the intervention, as opposed to other factors which may play a part, but are not obvious. To examine the possibility that something other than the discharge coordinator had produced an increase in duration of stay, data for all patients admitted during the three study periods were

extracted from routine hospital sources. It was found that no increase in duration of stay had taken place over the study period, suggesting that the work of the discharge coordinator was the important variable in slightly increasing stays between phase II and phase III. It seems that the introduction of the checklist in phase II may have had the earlier effect of reducing duration of stay, whereas the further intervention of human decision making (the discharge coordinator) in effect negated this and increased the duration of stay.

In the United States, hospital managers have been sufficiently convinced that discharge coordinator's carry out good quality discharge planning and that they improve the efficiency of bed use and are therefore cost effective. Such posts have been introduced in many hospitals. We think that although the United Kingdom should seriously consider any measure that improves quality and efficiency, it is important that it is not introduced without proper evaluation.

More patients in phase III saw a social worker. It is possible that the recommendations of a social worker might have masked a reduction in duration of stay. Patients in phase III were also less likely to see a GP after discharge, implying that their process of discharge obviated any need for this.

Moving on to appropriateness of days of care, appropriateness rates were very low, especially in phases I and III. This is because the day of care was taken to be the full day preceding the day of discharge and it is known from previous studies using the appropriateness evaluation protocol,²⁶ that the closer a day is to the patient's discharge the less appropriate it is likely to be. It is impossible to say why appropriateness rates were so much higher for phase II. This may have been due either to natural variation or perhaps an unusual increase in pressure on beds at that time. What is clear is that the discharge coordinator did not have any beneficial effect on appropriateness of bed use.

Finally, we looked at readmission rates as they may act as indicators of appropriateness and quality of discharge. No changes were found in readmission rates, although there was a decrease for all patients admitted during the same periods. The Philadelphia study on discharge planning³ was published after the analysis of our data, and in the course of preparation of this paper. This group reported that the introduction of a discharge planning protocol (not planner) had no effect on the initial duration of stay (7.4–7.5 days for a similar elderly population) but the chances of hospital readmission within 14 days were significantly less in the intervention group (3/72 as opposed to 11/70). One possible explanation for at least the part of the group differences in the United States study is that randomisation resulted in an excess of men in the intervention group (M:F intergroup ratio 1.4:1), and it is known that male sex is more strongly associated with readmission,²⁷ perhaps reflecting different expectations between the sexes. The study cited by Weissman and colleagues²⁸ shows how

difficult it would be to use only readmission rates as a measure of success of discharge planning. Income, social class, and home ownership were all associated with readmission rates in their study, yet these data items are not routinely captured by health services.

It is difficult to analyse the costs and benefits of the introduction of a discharge coordinator as so many factors are involved. This would necessitate the estimation of costs saved through lower consultation rates with GPs, lower hospital doctor consultation rates, possibly lower readmission rates (and lower use of community services for those whose discharge was delayed), and the benefits of freeing nurses time by relieving them of some of the responsibility for discharge planning. It is difficult to express in monetary terms the benefits of avoiding problems after discharge, increasing patient satisfaction, increasing compliance in treatment, and reducing problems with transport. Added to these problems are the difficulties in distinguishing the costs that would be saved by the hospital from those saved by primary care and community services. Hospital managers are unlikely to be very concerned about the costs of community services, given the way that health care is funded at present in the United Kingdom. In different systems of health and social care however, useful cost savings may result, at least for the hospital.⁵

The costs of the discharge coordinator, except for salary, are equally difficult to estimate. There is the increase in duration of stay in our study but this cannot be simply estimated from average costs per bed day as costs fall the further a patient is into an admission. There are the extra costs resulting from an increased referral rate to social workers and health professionals, an increase in paperwork, numbers of telephone calls, and time taken to liaise with colleagues. The one cost which is simple to estimate is the salary of the discharge coordinator, which was nursing grade F. The cost per patient discharged was £21 on the basis of the discharge coordinator assessing and planning the discharge for an average of 14 patients a week.

The ideal design for an intervention study of this kind would be a randomised controlled trial – that is, random allocation of patients into two groups in which one group would receive the intervention, in this case, the services of a discharge coordinator, and the other would not. However, we considered that there were some serious and insurmountable problems associated with this approach. Firstly, the random selection of patients would mean that those receiving intervention would often be situated in the wards next to controls. With no control over contact between these patients and between controls and other ward staff, “contamination” would be inevitable. Also, the presence of a discharge coordinator on the ward, a major part of whose job is to liaise with all staff involved with discharging patients, would undoubtedly result in a Hawthorne effect. In other words, discharge planning would improve generally during the period of study.

One possible solution to these problems was to obtain the intervention and control groups from different wards. However, it became clear during the planning phase of the study that standards of discharge planning varied widely between the three wards concerned and could not, therefore, be compared. Even if two wards were selected and discharge planning assessed both before and after the introduction of a discharge coordinator on one of the wards, with the other as the control, it is more than probable that the potential for improvement would be dependent on the standards before intervention and therefore the results would depend on which ward was chosen. It was for these reasons that a randomised control trial was rejected in favour of the intervention study. This study design had several advantages over a randomised controlled trial. There would be no contamination between patients; any general improvement in discharge planning occurring as a result of introducing a discharge coordinator would not affect the results; and the effect of the discharge coordinator could be isolated from the effect of imposing a new structure onto the discharge planning process.

Although the study results might be criticised for being person specific – that is, there was only one discharge coordinator evaluated – and therefore the results are dependent on the proficiency of that person, there are several ways in which the quality of that person’s work was monitored – for example, the proportion of cases in which a discharge form was completed, the proportion of patients who were assessed for discharge, and the referral rate to social workers. Such evidence showed the discharge coordinator to be highly efficient and unpublished data from a staff survey showed that she had formed excellent working relations and was reported to be helpful and supportive.

In conclusion, there was evidence that some aspects of the discharge process improved as a result of the implementation of the district’s discharge planning policy and the introduction of discharge check lists. These improvements were reflected in a moderate reduction in problems relating to the admission experienced by patients after discharge. The introduction of the discharge coordinator resulted in a further improvement in the discharge planning process, a reduction in problems after discharge, and a reduction in the need for medical and related services. However, there was no evidence that intervention resulted in more efficient or timely provision of services in the community or that improved discharge planning resulted in the improved efficiency of hospital bed use. Indeed, there were indications that the discharge coordinator increased, rather than decreased, duration of stay. There was also no evidence that the discharge coordinator had any effect on the overall physical and emotional outcome of a hospital admission. In summary, the introduction of a discharge coordinator in the United Kingdom improved the quality of discharge planning but at not inconsiderable cost. We would therefore question the recommendation in the recent

government report that discharge coordinators should be appointed.¹

Finally, most of the focus of health services research has been on the clinical effectiveness of medical interventions. There has been relatively little attention paid to evaluating methods of service delivery, or to the most appropriate methods of evaluating the effectiveness of organisational change. These gaps are glaring; not surprising, given the difficulties of designing and implementing randomised controlled trials in real life organisational situations and the urgent need for methodological debate. It is hoped that the study presented here will provide an illustration of the difficulties of a randomised controlled trial design, and an example of how alternative designs can provide fruitful data.

We thank the hospital staff and patients for their cooperation with this study, in particular the discharge coordinator, and Lesley Marriott for typing this manuscript. This work was supported by a grant from the Wellcome Trust.

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