The impact of a medicines management service on patients with cystic fibrosis

By Emma J. Frew, Bettina Kluettgens, Nicky Gilday, Peter Spurgeon, Baljit Ahitan, Stirling Bryan, Deirdre Doogan and David Honeybourne

Abstract

Aim
To explore the impact of a medicines management service on patient quality of life and stakeholder and patient satisfaction.

Design
Before and after study.

Subjects and settings
51 adult patients were recruited during a routine outpatient appointment at the centre for adults with cystic fibrosis, at Birmingham Heartlands Hospital in the West Midlands.

Results
There was no significant change to the quality of life of the patients. Subgroup analysis on the patient satisfaction results by disease severity did, however, suggest that patients with less severe forms of the disease were more satisfied with the medicines management service. There were concerns about communication between the stakeholders of the service, with GPs expressing concern that there was a lack of information/GP awareness.

Conclusion
Although the medicines management service had no impact on overall quality of life, it did seem to have an impact on patient satisfaction. Further research is needed to assess the true effectiveness of a medicines management service.

Cystic fibrosis is an inherited disease that mainly affects the respiratory and digestive systems. It varies in severity. Some patients present symptomatically at birth; others do not present until later.

Treatment has advanced with improvements in antibiotics, nutrition, physiotherapy and psychological support. Due to the complex multisystem nature of the disease, a multidisciplinary approach is recommended. This is normally provided at a specialist cystic fibrosis centre.

Patients with cystic fibrosis typically take large numbers of medicines. Most of the regular medication is prescribed by GPs. However, the newer, more complex treatments are initiated and provided by hospital pharmacists.

This process can impose a considerable burden on the patient, with long waiting times at the pharmacy and a considerable volume of material to transport home (in particular when prescribed intravenous antibiotics). There may also be problems with adherence to different drug regimens.

The NHS Plan and the Pharmacy in the Future policy documents set out the importance of having an effective system of medicines management to ensure that medicines are used in a cost-effective and safe manner and to maximise the benefit patients derive from their medicines while minimising potential harm.

Medicines management provides an opportunity for communication between the specialist consultant, pharmacist and GP, facilitating a smooth transition of pharmaceutical care between primary and secondary care. Although the national Medicines Management Services Collaborative (MMSC) has examples of how medication review has improved services for some patients, no supporting evidence exists for the value of a medicines management service for patients with cystic fibrosis.

The collaboration between the West Midlands Adults with Cystic Fibrosis Centre (WMACFC) at Birmingham Heartlands Hospital, the University of Birmingham and Lloydspharmacy provided a unique opportunity to evaluate the effectiveness of a medicines management service in this context. The study addressed the following questions:

- Does a medicines management service improve the quality of life of patients with cystic fibrosis?
- Does such a service improve communications between health professionals across primary and secondary care and help them work in partnership?

Methods
Study design and patient recruitment
A before-and-after study was undertaken where the before phase comprised 10 weeks of usual care and the after phase extended over four months. During the before phase, there was no change to the service and information on the type and level of services used by patients was recorded. After 10 weeks of observation, the patient entered the after phase and received the medicines management service for four months. Data were collected at specific intervals. The after phase was longer since it was thought that patients needed time to experience, adapt to and form a judgement about the medicines management service.

A research nurse recruited adult patients attending the outpatient clinic if they were under the clinical responsibility of Heartlands Hospital, lived at a permanent address in the community, and were willing to consent to Lloydspharmacy providing the medicines management service. Inpatients and patients with no permanent address were excluded. Written informed consent was obtained from all participants. Birmingham East District Research and Ethics Committee approved the study design.

The medicines management service
Throughout the after phase, the medicines management service provided a comprehensive home delivery service of all prescription medication within 24 hours and home visits by the community pharmacist to review medication. Before the first home visit, the community pharmacists were given a summary of the patient's hospital notes including medical, social and prescription details.

The initial visit lasted about one hour and 15 minutes. The pharmacist asked the patients to make available for review all their medicines, whether hospital, community or over the counter. The pharmacist then discussed each medicine with the patient to assess compliance and concordance and to ensure that the medicines were being taken in accordance with hospital prescription records. The pharmacist ensured that patients understood how and why they were taking each medicine and, if necessary, counselled the patient. Any interaction between over-the-counter and prescribed medicines was assessed. Finally, the pharmacist removed out-of-date or unwanted drugs.

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After the review with the patient the pharmacist discussed any discrepancies or problems with the hospital or GP. The GP was advised of recommended changes to repeat prescriptions. The general objective of the home visits was to improve the management of existing medication. Alterations to prescription medicines were only suggested if it was believed this would make things easier for the patient.

A follow-up visit was made at the end of the after phase to reinforce advice, assess compliance and provide an opportunity for patients to ask questions. Throughout the after phase all outpatients and primary care prescriptions were delivered to the patient. During this phase Lloydspharmacy acted as a home care provider by supplying all outpatient medicines against hospital prescriptions and invoicing the hospital monthly. This allowed patients to return home after their appointment without having to wait at the hospital pharmacy.

Control group Because of the nature of the intervention, no placebo could be provided. To allow patients the opportunity to reflect on and form a judgement about the new medicines management service a before-and-after design was deemed appropriate. The control element was the usual care provided in the before phase, where patients presented prescriptions at the hospital pharmacy.

Outcome data and analysis For the outcome measurement we used three data collection instruments: a patient satisfaction questionnaire, the cystic fibrosis quality of life instrument and a critical incident form. Patient self-assessed quality of life was measured using the validated cystic fibrosis quality of life instrument. Patient satisfaction was assessed using two instruments: a purpose developed satisfaction questionnaire and a critical incident form. The patient satisfaction questionnaire contained items derived through discussion with clinical staff at Heartlands Hospital directly involved with the delivery of patient care.

Patients were asked to rate a series of statements about aspects of the service on a seven-point Likert scale ranging from 1 (completely disagree) to 7 (completely agree). The aim was to measure patient satisfaction with each service design, this being the service during the before phase or the medicines management service in the after phase.

The questions for each phase were different. This reduced the direct comparability of the two phases since some elements of provision only applied to one phase or the other. The purpose of the questionnaire was to provide information on the feelings of patients in terms of thoughts and understanding, and general satisfaction. The data were therefore treated separately, the first representing a level of satisfaction with current, usual service and the other relating to the medicines management intervention.

Outcome data and analysis

The cystic fibrosis quality of life instrument is a validated disease-specific instrument that was used to elicit quality of life information for both phases of the study so direct comparisons can be made. Both the quality of life instrument and the patient satisfaction questionnaire were administered at the end of the before and after phases. In addition patients recorded any issues, good or bad, about the service by completing a critical incident form issued at the end of each phase of the study and half way through the after phase.

Staff perceptions were recorded using telephone interviews. Three relevant staff groups were identified: staff providers at Heartlands Hospital who had direct contact with the patient group; primary care trust (PCT) representatives who would ultimately be responsible for commissioning a service; and GPs with patients in the study. The providers and PCT representatives were interviewed by telephone and the GPs were asked to complete a one-page questionnaire about the project. Any GP who expressed concern about the service was interviewed in a follow-up telephone call.

Alongside patient demographic information, disease severity was recorded, with the number of intravenous antibiotic days in a year (2003) used as a measure of severity (treatment burden score). If the number of days fell within the range of 0–60 the patient was recorded as “mild” (code 1); if greater than 61 days then the patient was recorded as “severe” (code 2).

It was thought that the traditional severity grouping using the cystic fibrosis clinical bands 1–5 was not appropriate because the allocation to a particular band partially depends on whether antibiotics are given to the patient as an inpatient or outpatient. Therefore the use of the number of intravenous antibiotic days was thought to be a more appropriate measure of severity. We will call this severity grouping the treatment burden score.

**Results**

**Patient details**

Between July 2003 and January 2004, 97 patients were invited to participate; 72 (74 per cent) patients agreed. During the study 20 patients withdrew, 14 in the before phase and six in the after phase. Patient progress and reasons for withdrawal are outlined in Figure 1. Not all patients provided a reason and some offered more than one reason. Full analysis was conducted on patients who completed both phases of the study, hence the 51 patients who completed the after phase.

Demographic details of the study sample for both phases are displayed in Table 1 with the appropriate statistical test results for any differences. There are no statistical differences in the demographics between the before and after phase.

![Figure 1: Flowchart showing progress of patients through the study](image-url)
Medicines management visits  During the after phase all patients received the medicines management service and the pharmacists recorded 136 interventions during the medicines management visits. Of these, 90 (66 per cent) involved only the pharmacist and did not require referral to other health-care staff. These interventions were classified as suggested by Krksa et al:5

- Need for education: 77 (86 per cent)
- Compliance issue: nine (10 per cent)
- Out of date medicines: three (3 per cent)
- Repeat prescribing: one (1 per cent)

The remaining interventions included the GP (25 per cent), hospital (5 per cent), hospital and GP (2 per cent) and the community pharmacy (2 per cent). Of 37 interventions recommended to the GP 35 were followed up successfully. Of these, 33 (94 per cent) accepted the recommended advice and agreed to act on it. Two (6 per cent) did not accept the advice, and two (6 per cent) had no response recorded. Two recommended interventions were not accepted by the GP because they related to the pharmacist suggesting new medication that was not in the formulary.

After follow-up by the pharmacist, 20 prescription changes were recorded. These can be classified into the following groups (as suggested by Zermansky et al):5

- Formulation change: 15 (75 per cent)
- New drug started: two (10 per cent)
- Drug stopped: one (5 per cent)
- Dose changed: one (5 per cent)
- Other (label change): one (5 per cent)

Patient satisfaction with intervention Thirty-seven (73 per cent) patients completed the satisfaction questionnaire in the before phase. Patients were unhappy with the time they have to wait at the hospital pharmacy. A mean score of 6.06 suggested a considerable degree of agreement with the statement that they have to wait a long time. This contrasts with the response to a similar statement about community pharmacy, where a mean of 3.24 suggests far less concern about waiting in this setting. Many patients indicated that they experienced difficulty in carrying drugs home after a hospital visit (mean=5). Patients believed they had a good understanding of why they have a particular set of drugs and the impact of not taking them (mean=6.45).

The after phase satisfaction questionnaire (response rate: n=31 [61 per cent]) provided useful and largely positive data on the medicines management service. It seemed that patients were comfortable with a pharmacist entering their home (mean=5.94) and this was not thought to be intrusive (mean=2.3 — a reverse scale). The pharmacists were well regarded and were viewed as competent and professional (mean=6.23).

The broad sense from this group of patients was that the medicines management service was an improvement and helped them to cope with their condition. The results from the patient satisfaction questionnaire for both the before and after phase are detailed in Table 2. The patient satisfaction items were also compared in terms of condition severity, using the treatment burden score. An analysis of variance (ANOVA) test was applied to compare means between the two severity conditions.

The statistically significant items are reported in Table 3. This suggests that patients in the less severe group were more positive about these aspects of the service.

A final question in the patient satisfaction questionnaire asked how important the patients believed it was that the new service was continued, with the responses measured on a seven-point Likert scale (1=very important and 7=very unimportant). The distribution of responses to this question suggests that members of the less severe disease group (median=1.5) are more in favour of the service continuing than patients in the severe disease

<table>
<thead>
<tr>
<th>Table 1: Sample characteristics</th>
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</thead>
<tbody>
<tr>
<td><strong>Characteristic</strong></td>
</tr>
<tr>
<td>Female</td>
</tr>
<tr>
<td>Age (mean [median])</td>
</tr>
<tr>
<td>Marital status: single</td>
</tr>
<tr>
<td>Ethnic origin</td>
</tr>
<tr>
<td>White</td>
</tr>
<tr>
<td>Pakistani</td>
</tr>
<tr>
<td>Missing</td>
</tr>
<tr>
<td>Number of children</td>
</tr>
<tr>
<td>Zero</td>
</tr>
<tr>
<td>&gt; One</td>
</tr>
<tr>
<td>Missing</td>
</tr>
<tr>
<td>Employment status</td>
</tr>
<tr>
<td>Employed</td>
</tr>
<tr>
<td>Unemployed</td>
</tr>
<tr>
<td>Student</td>
</tr>
<tr>
<td>Housewife/husband</td>
</tr>
<tr>
<td>Retired</td>
</tr>
<tr>
<td>Missing</td>
</tr>
<tr>
<td>Education: highest level</td>
</tr>
<tr>
<td>University</td>
</tr>
<tr>
<td>College</td>
</tr>
<tr>
<td>Higher education</td>
</tr>
<tr>
<td>Missing</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Table 2: Responses to patient satisfaction questionnaire*</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Before phase patient satisfaction response (n=37)</strong></td>
</tr>
<tr>
<td>I generally have to wait a long time at hospital pharmacy</td>
</tr>
<tr>
<td>I generally have to wait a long time at community pharmacy</td>
</tr>
<tr>
<td>My GP always gives me prescription I want</td>
</tr>
<tr>
<td>I understand why I need set of drugs and effect of not taking them as prescribed</td>
</tr>
<tr>
<td>I worry about running out of drugs I need</td>
</tr>
<tr>
<td>I constantly worry about infection</td>
</tr>
<tr>
<td>I experience difficulty carrying drugs home after hospital visit</td>
</tr>
<tr>
<td>I worry about community pharmacy not having drugs I need</td>
</tr>
<tr>
<td>I am overall satisfied with the way I get the drugs that I need</td>
</tr>
</tbody>
</table>

| **After phase patient satisfaction response (n=31)** | **Mean** | **Median** | **SD**** |
| I felt comfortable with someone coming into my home | 5.94 | 7 | 1.482 |
| The drugs always arrived when I expected | 5.42 | 6 | 2.062 |
| The pharmacist I saw seemed competent and professional | 6.23 | 7 | 1.707 |
| Having someone come to see at home felt intrusive | 2.30 | 2 | 1.745 |
| My main carer felt the service made it easier to support me | 4.78 | 4 | 2.225 |
| I tended to worry about drugs not arriving when I needed them | 3.45 | 3 | 2.299 |
| Found it easier to cope with my condition | 4.74 | 5 | 2.250 |
| I value not having to visit the community pharmacy to collect my drugs | 5.03 | 7 | 2.442 |
| The service was great improvement on previous situation | 4.94 | 6 | 2.380 |
| Knowing the drugs would be delivered made me feel more in control | 4.81 | 5 | 2.312 |

* Responses to each of the questions are measured using a 7-point Likert scale ranging from 1 (completely disagree) to 7 (completely agree)
** SD = standard deviation
are neutral and simply descriptive of the study process. Since this was an open format measure and completed at the discretion of the patients, the results are subjective and not representative, but a selection of comments reported in Panel 1 are indicative of the type of points raised.

**Staff perception of intervention**

Because the service was new it was considered important to assess the views of key stakeholder groups that might be affected by the existence of a medicines management service. A small sample of staff or PCT representatives (n=2) and hospital staff (provider perspective) (n=2) were interviewed by telephone. The information collected from the telephone interviews was largely derived from an open-ended conversation from a small sample of individuals from each perspective. The results therefore are sentiments and phrases from these few people and cannot be regarded as representative but are interesting nonetheless.

**PCT perspective**

No specific problems were raised by the PCT representatives in the telephone interviews. However the staff did not feel particularly involved with the study and felt this was a missed opportunity because they are responsible for patients through their PCT function and relationships with GPs.

**Provider perspective**

Staff at Heartlands hospital generally believed that patients were positive about the service and relieved not to have to transport bulky items. One issue raised was the lack of weekend provision. It was thought that if patients needed drugs urgently this might pose a problem. Also on rare occasions there was difficulty in scheduling the visit by the pharmacist and this could result in delayed access to the medicines.

**Discussion**

Current policy documents have stressed the importance of regular reviews of medicines management services in the community. Lord Darzi in his recent review of the NHS recommends delivering care closer to home and ensuring that all chronically ill patients have a personal care plan. 7 There are many examples of these individuals are not statistically different to the rest of the sample.

The cystic fibrosis quality of life instrument questionnaire contains 52 items in nine domains: physical functioning; role limitation due to emotional problems; role limitation due to physical problems; body image and physician concern; vitality; social functioning; treatment issues; chest symptoms; emotional responses; concerns for the future; interpersonal relationships; body image and career issues. Responses to the questionnaire are measured by a six-point Likert scale ranging from 1 (very strongly agree) to 6 (very strongly disagree). Responses to the former indicate a negative response. Each domain is scored using a weighted algorithm and presented on a 0–100 scale with zero representing worst quality of life and 100 representing best quality of life. Thus, a transformed domain score of 50 or less indicates a negative response and suggests that the individuals are experiencing difficulties with that domain. Table 5 presents the mean scores for each domain for both the before and after phase for the 26 patients who completed the questionnaire in both phases.

The research team used a paired sample t-test to assess the impact of the medicines management programme on the quality of life across all the domains of the cystic fibrosis quality of life instrument in both phases of the study (n=26; 51 per cent). The demographic characteristics of these individuals are not statistically different to the rest of the sample.

**Table 3: Significant patient satisfaction response by treatment burden score**

<table>
<thead>
<tr>
<th></th>
<th>Group 1 (mild)</th>
<th>Group 2 (severe)</th>
<th>F statistic</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>The pharmacist I saw seemed competent and professional</td>
<td>6.81</td>
<td>5.60</td>
<td>4.341</td>
<td>0.046</td>
</tr>
<tr>
<td>Found it easier to cope with my condition</td>
<td>5.38</td>
<td>4.21</td>
<td>5.929</td>
<td>0.021</td>
</tr>
<tr>
<td>I value not having to visit the community pharmacy to collect my drugs</td>
<td>5.88</td>
<td>4.13</td>
<td>4.380</td>
<td>0.045</td>
</tr>
<tr>
<td>The service was great improvement on previous situation</td>
<td>5.75</td>
<td>4.07</td>
<td>4.380</td>
<td>0.047</td>
</tr>
</tbody>
</table>

**Table 4: GP responses to stakeholder questionnaire**

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes n (%)</th>
<th>Maybe to some extent n (%)</th>
<th>No n (%)</th>
<th>Missing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Did the initial letter from Lloyds/Heartlands provide a sufficiently clear explanation?</td>
<td>23 (70)</td>
<td>7 (21)</td>
<td>3 (9)</td>
<td></td>
</tr>
<tr>
<td>Did you feel adequately informed about the project?</td>
<td>18 (55)</td>
<td>9 (27)</td>
<td>6 (18)</td>
<td></td>
</tr>
<tr>
<td>Did you have any misgivings about your own or your patient’s participation?</td>
<td>10 (30)</td>
<td>6 (18)</td>
<td>17 (52)</td>
<td></td>
</tr>
<tr>
<td>Did you see the patient during the time of the project?</td>
<td>17 (52)</td>
<td>0 (0)</td>
<td>16 (48)</td>
<td></td>
</tr>
<tr>
<td>Did the patient raise any issues or concerns about the project?</td>
<td>1 (3)</td>
<td>1 (3)</td>
<td>29 (88)</td>
<td>2 (6)</td>
</tr>
<tr>
<td>Were you aware of any project interventions or advice given to the patient?</td>
<td>4 (12)</td>
<td>2 (6)</td>
<td>27 (82)</td>
<td></td>
</tr>
<tr>
<td>Did you feel that this advice or intervention was useful?</td>
<td>5 (15)</td>
<td>7 (21)</td>
<td>9 (27)</td>
<td>12 (36)</td>
</tr>
<tr>
<td>Did you feel you were left out of the loop?</td>
<td>7 (21)</td>
<td>7 (21)</td>
<td>16 (48)</td>
<td>3 (9)</td>
</tr>
<tr>
<td>Were you concerned about the impact on your relationship with the patient?</td>
<td>1 (3)</td>
<td>5 (9)</td>
<td>29 (88)</td>
<td></td>
</tr>
<tr>
<td>Are you generally happy with this type of external service?</td>
<td>15 (45)</td>
<td>7 (21)</td>
<td>9 (27)</td>
<td>2 (6)</td>
</tr>
</tbody>
</table>
A common pattern of treatment in the UK is for patients to obtain repeat prescriptions from their GP and to visit a community pharmacy to collect the medicines. Most patients visit a specialised cystic fibrosis unit where intravenous antibiotics are prescribed and then obtained at the hospital pharmacy. This can impose a considerable burden on patients due to long waiting times, alongside the inconvenience of transporting the large volume of drugs and other items home.

In response to patients reporting considerable inconvenience, Lloydspharmacy in collaboration with Heartlands hospital developed a medicines management service purposed to overcome some of the problems encountered by patients. Specifically, the service was developed with the objective of improving patient education with the help of a community pharmacist visiting the patient at home, and to decrease the burden to patients through home delivery, within 24 hours, of all dispensed medicines. This study was designed to measure quality of life and stakeholder and patient satisfaction.

Our findings suggest no significant impact on quality of life as a result of the medicines management service. The medicines review was intended to help patients understand their drugs better, increase adherence to drug regimens, remove any out-of-date medicines, report possible drug interactions or reactions to the GP and to suggest alternative medicines. We expected a change in quality of life a priori but accept, with hindsight, that our choice of quality of life instrument may not have been sensitive enough for this purpose.

The cystic fibrosis quality of life instrument is a general cystic fibrosis questionnaire that seeks to address a wide range of issues associated with having the disease. One explanation is that the intervention did not impact upon these general issues but did affect patient quality of life in other areas that were not incorporated within the cystic fibrosis quality of life instrument questionnaire.

The future issues domain, for example, asks questions relating to future fertility problems, life expectancy, the possibility of a future heart-lung transplant etc. These issues are not likely to be affected by the medicines management service. Overall, the quality of life of patients did not improve significantly, but when analysed by disease severity, the treatment issues domain improved significantly in the less severe group.

Our patient satisfaction questionnaire was designed to ask questions pertaining to the actual service received to gauge the feeling of the patients in terms of thoughts and understanding and general satisfaction with the before phase (usual care) and the medicines management service. For this reason, and since this is an unvalidated instrument, the responses from the before and the after phases.
ease in its mild form means that patients have
favoured more by patients with less severe
phase, the patient satisfaction results between
comparisons between the before and after
have expressed that disagreement.
If the patients felt strongly enough they could
agree as well as agree with each statement so
patients were given the opportunity to dis-
medicines management service. However, the
after phase are presented separately.
Table 6: Comparisons of quality of life response (before
Domain
Panel 2: Views of concerned GPs who were contacted by phone
Concern
Greater practice workload
Lack of information/GP awareness
No added benefit
No choice of pharmacy
Less local patient monitoring
Number of GPs who expressed concern
3
9
5
3
3
The medicines man-
agement service provides
these patients with an op-
portunity to liaise with community
pharmacists to enhance their under-
standing of their condi-
tion and removes the burden of collecting and
transporting medicines
thus helping patients to lead a normal
lifestyle. One important finding from this study is
that for medicines management to improve
the pharmaceutical care between primary and
secondary care, GPs need to be adequately
informed. A number said that they were un-
aware of any intervention or advice offered to
their patient and were worried about a possi-
ble impact on the doctor–patient relationship.
This was surprising given that all GPs re-
ceived a summary letter detailing interven-
tions at the end of the study. It is envisaged
that this issue could be adequately addressed
should the medicines management service
become established, but an important part of
this process would be to involve GPs at an
early stage.
The Department of Health encourages the
practice of medicines management for all pa-
tients with chronic conditions. Positive re-
results have come from medicines management
focused on other diseases such as heart fail-
ure. The HOMER trial, however, reported
counterintuitive results, concluding that
that medicines review led to a higher rate of
hospital admissions among older people. This
finding led to the conclusion that more re-
search is needed to explore the most effective
model of delivering a medicines management
service.
Overall, we have shown from this study
that a medicines management service for pa-
tients with cystic fibrosis has the potential to
reduce the burden of the disease. Outsourcing
outpatient dispensing can release hospital
pharmacists’ time to focus on inpatient activ-
ity. Through the use of the patient satisfaction
questionnaire, the research showed that pa-
tients had a favourable attitude towards the
intervention. However, this instrument was
purpose-built for the study and therefore of-
fers more of a suggestion of the expected out-
come rather than a robust result.
If medicines management services are to
be offered, patients should be given the
decision to participate depending on their per-
sonal circumstances and preferences. Further
research is needed to assess whether a medi-
cines management service within cystic fi-
brosis can lead to a reduction in hospital admissions and medicines waste to and a sus-
tained improvement in clinical outcomes.

Panel 1: Perceptions of medicines management service*

Positive perceptions
- Having a pharmacist take a look at all
prescriptions and drug management, rather than
just prescribing what is put in front of them
should probably be standard practice as a buffer
for the occasional errors of incompatibility that
doctors can make.
- It was better for me when I ordered a lot
of tablets as they came straight to me and I felt
safer knowing they were going to be delivered.
- Not having to wait in the hospital for ages.
- Communication was excellent. Always kept
informed and X even chased up my drugs
prescription when it was late.
- Punctuality of delivery was brilliant. Overall
service was excellent. Dialogue was
informal and friendly, communication very good
and had no problems at all.

Negative perceptions
- I feel it is important to build a relationship with a
pharmacist, and, although this has happened
because of the visits, I would be concerned
about taking a delivery-based service without
that contact remaining regular.
- I was conscious of getting a delivery for just one
box of pills. It seemed a bit overkill once or twice.
- If ordering drugs near a bank holiday it takes a
lot longer to receive the drugs, very worrying if
I’ve run out of the drug which has been ordered.
- I work so it is not always easy to arrange a good
delivery time during term time (I work term time
only).
- Had a couple of IV courses delivered with only
two tiny boxes. Not enough if you are using
three drips a day — need four.
- Wouldn’t deliver at weekends.

* From critical incident form

Table 6: Comparisons of quality of life response (before versus after phase)

<table>
<thead>
<tr>
<th>Domain</th>
<th>t- statistic (P-value)</th>
<th>Z- statistic (P-value)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical functioning</td>
<td>0.238 (0.814)</td>
<td>-0.115 (0.909)</td>
</tr>
<tr>
<td>Social functioning</td>
<td>0.086 90.933</td>
<td>-0.139 (0.889)</td>
</tr>
<tr>
<td>Treatment issues</td>
<td>0.455 (0.653)</td>
<td>-0.870 (0.384)</td>
</tr>
<tr>
<td>Chest symptoms</td>
<td>0.030 (0.976)</td>
<td>0.000 (1)</td>
</tr>
<tr>
<td>Emotional relationships</td>
<td>-0.299 (0.767)</td>
<td>-0.552 (0.581)</td>
</tr>
<tr>
<td>Future concerns</td>
<td>-0.295 (0.840)</td>
<td>-0.535 (0.593)</td>
</tr>
<tr>
<td>Intimate relationships</td>
<td>1.453 (0.159)</td>
<td>-1.497 (0.134)</td>
</tr>
<tr>
<td>Body image</td>
<td>-1.424 (0.167)</td>
<td>-1.484 (0.138)</td>
</tr>
<tr>
<td>Career issues</td>
<td>0.619 (0.542)</td>
<td>-0.421 (0.667)</td>
</tr>
</tbody>
</table>

are not directly compared. The results of pa-
tient satisfaction in the before and then in the
after phase are presented separately.
The manner in which some of the ques-
tions were phrased could have led the re-
spondents to a positive response towards the
medicines management service. However, the
patients were given the opportunity to dis-
agree as well as agree with each statement so
if the patients felt strongly enough they could
have expressed that disagreement.
Although we could not directly draw
comparisons between the before and after
phase, the patient satisfaction results between
the two disease severity groups within each
phase of the study can be compared. These
results suggest that the intervention was
favoured more by patients with less severe
forms of the condition. The nature of the dis-
ease in its mild form means that patients have
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