Effectiveness and costs of acute day hospital treatment compared with conventional in-patient care

Randomised controlled trial

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Background Data on effectiveness of acute day hospital treatment for psychiatric illness are inconsistent.

Aims To establish the effectiveness and costs of care in a day hospital providing acute treatment exclusively.

Method In a randomised controlled trial, 206 voluntarily admitted patients were allocated to either day hospital treatment or conventional wards. Psychopathology, treatment satisfaction and subjective quality of life at discharge, 3 months and 12 months after discharge, readmissions to acute psychiatric treatment within 3 and 12 months, and costs in the index treatment period were taken as outcome criteria.

Results Day hospital patients showed significantly more favourable changes in psychopathology at discharge but not at follow-up. They also reported higher treatment satisfaction at discharge and after 3 months, but not after 12 months. There were no significant differences in subjective quality of life or in readmissions during follow-up. Mean total support costs were higher for the day hospital group.

Conclusions Day hospital treatment for voluntary psychiatric patients in an inner-city area appears more effective in terms of reducing psychopathology in the short term and generates greater patient satisfaction than conventional in-patient care, but may be more costly.

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A recent survey reported 102 psychiatric services in England describing themselves as 'acute day hospitals'; 66% of these services rated the provision of an alternative to acute in-patient care as being of 'great' or 'greatest importance' to their service (Briscoe *et al*, 2004). A systematic review of randomised controlled trials of day hospitals concluded that day hospital treatment is generally cheaper and associated with greater treatment satisfaction than in-patient treatment (Marshall *et al*, 2001). However, findings on improvements in psychopathology are inconsistent and reviews agree that more primary research on the efficacy of day hospital care is needed (Hortwitz-Lennon *et al*, 2001; Marshall *et al*, 2001). We conducted a randomised controlled trial comparing conventional in-patient care with treatment in a day hospital that exclusively provides an acute service as part of a modern community mental healthcare system.

METHOD

Sample

All patients admitted to the three adult acute psychiatric wards serving an inner-city London borough were screened for eligibility for day hospital treatment by the senior house officer at the time of admission. Within 24 h all eligible patients were approached by a researcher who explained the nature of the study and obtained written informed consent. Exclusion criteria included: compulsory admission, homelessness, organic brain disorder, a primary diagnosis of an addictive disorder or inability to give informed consent (Table 1). Randomisation to day hospital or in-patient treatment was in blocks, using sealed envelopes opened by the researcher. Randomisation was weighted in favour of the day hospital to ensure it had enough patients to function.

Treatment settings

The in-patient wards provided conventional psychiatric care, including a limited programme of optional daily activities. The day hospital was based on an approach first established in Germany in the 1970s (Priebe & Gruyters, 1994). It exclusively treated acute patients as an alternative to in-patient care, and did not provide after-care to shorten in-patient treatment or facilitate the transition from hospital to community (Priebe, 2002). The day hospital had 20 places. Patients were expected to attend the full programme from 09.30 to 16.30 h every weekday; patients who did not attend for 3 consecutive days were discharged. These stringent attendance requirements were based on the experience that a more flexible approach makes it difficult for day hospitals to sustain their focus on acute treatment over a long time. At weekends there was an optional drop-in service. The day hospital was organised around a structured, intensive group-based programme which included a range of verbal, non-verbal, creative and work-based interventions. There were two alternative 'strands' to meet the different needs of the patients and ensure manageable sizes for group activities: one was more structured with a focus on practical activities and protected interactions; the other was more stimulating with a focus on creative group programmes and verbal communication. The day hospital was integrated into a modern community care system, i.e. the consultant responsibility remained with the catchment area consultants and care programme approach coordination with the care co-coordinators in the fully developed and integrated community mental health teams.

The study took place over a 3-year period during which there were no significant changes to policy and practice in the day hospital or other aspects of the service. The study was approved by the Ethics Committee of the East London Health Authority.

Outcome measures

Effectiveness

Psychopathology, subjective quality of life and treatment satisfaction at discharge, 3 months and 12 months after discharge, as well as readmissions within 3 and 12 months of discharge, were taken as measures of the effectiveness of treatment.

Table 1 Reasons for exclusion from day hospital treatment of patients admitted voluntarily

Reason for exclusion	n (%)
Homelessness	82 (10.3)
Severity of disorder necessitates in-patient treatment	69 (8.7)
Suicide risk	55 (7.0)
Alcohol/substance addiction is primary diagnosis	47 (5.9)
Risk to others	42 (5.3)
Unable to give informed consent (e.g. language problem)	34 (4.3)
Transfer from another hospital	15 (1.9)
Somatic disorder requiring in-patient care	10 (1.3)
Learning disability	9 (1.1)
Organic disorder	4 (0.2)
Acute intoxication	3 (0.4)
Journey to day hospital more than 60 min	2 (0.3)
Refused consent	135 (17)
Other reason	73 (9.2)

Discharge was used as a reference assessment point because it represents the endpoint of the treatment. Psychopathology and subjective quality of life were also assessed at the time of randomisation (baseline) so they could be controlled for in the analyses.

Psychopathology was measured using the 24-item version of the Brief Psychiatric Rating Scale (BPRS; Ventura *et al*, 1993). Subjective quality of life was assessed using the Manchester Short Assessment of Quality of Life (MANSA; Priebe *et al*, 1999) whereby patients assess their satisfaction with 12 life domains on a Likert-type rating scale. Treatment satisfaction was assessed with the Client's Assessment of Treatment Scale (CAT; Priebe *et al*, 1995) whereby patients also use a Likert-type scale to assess seven aspects of treatment. Each participant's mean score of the items on each scale was calculated and used in the analysis. Information on re-admissions to either the day hospital or an acute psychiatric ward was collected from patients' self-reports and hospital records.

Costs

Data on resource use were captured on a specially adapted version of the Client Service Receipt Inventory (CSRI; Beecham & Knapp, 2001). Data were collected on

resource use over the 3 months prior to admission (baseline) and over the 'treatment period' between admission and discharge from the ward or day hospital. Data were collected on: specialised and domestic accommodation arrangements and living expenses; in-patient admissions; day hospital attendance; out-patient and emergency room attendance; other day activity services; medication; contact with community-based health and mental health services, primary care, services offering complementary therapies, social care services (such as social workers), and police and the courts. By combining data on the frequency and duration of service use with unit costs, the total support costs reflecting the intensity of support actually used were calculated for each patient. Unit costs were taken from a compendium of nationally applicable unit costs (Netten & Curtis, 2002) or calculated specially for this project using an equivalent methodology. All unit costs are the closest approximation of their long-run marginal opportunity value calculated using average revenue costs plus the costs associated with capital and over-heads (Beecham, 1995). Costs per person are presented at 2001–2002 levels and informal care costs were not included in this analysis. Socio-demographic information was also collected at each time-point.

Data collection

All questionnaires were administered by trained researchers, with the interviews taking place in the hospitals, patients' homes or a research office as appropriate. As first interviews were conducted in the acute settings, researchers were not masked to allocation status.

Statistics

The Statistical Package for the Social Sciences (version 10 for Windows) was used to compare the day hospital and in-patient groups in an intention-to-treat analysis. One-way analyses of covariance (ANCOVA) were conducted on mean scores of BPRS and MANSA at discharge and at follow-up. Baseline mean scores were entered as covariates. Where dependent variables were scores at discharge, length of stay (in days) was also entered as a covariate to control for differing lengths of treatment. Mean CAT scores of the two groups were compared at discharge and 3 months and 12 months after

discharge using *t*-tests. The number of read-missions among those randomised to the day hospital compared with those randomised to the ward were compared using χ^2 tests, with *t*-tests employed to compare the number of days spent in readmissions. The mean treatment costs for the two groups were compared using *t*-tests, with the results confirmed by bootstrapped (1000 replications) confidence intervals using Stata software, release 8.0 for Windows.

RESULTS

Participants

Flow through the study

During the study enrolment period (May 1999 to May 2002) 1395 patients aged 18–65 years were admitted to the hospital. Exclusions are summarised in Fig. 1 and Table 1. Written informed consent was obtained from 209 eligible patients; 65 were randomised to in-patient wards and 144 to the day hospital. Two of the patients randomised to the day hospital withdrew consent after randomisation. One further patient randomised to the day hospital was excluded from all cost and outcome analyses because he had not been discharged from the day hospital when the data collection period ended. Therefore 206 patients were included in the study. Of these 111 (78 day hospital, 33 ward) were assessed at discharge, representing a follow-up rate of 54%; 95 were lost to follow-up owing to: (a) unexpected or unplanned discharge whereby research staff were not informed; (b) self-discharge; (c) patients not returning from leave; (d) discharge because of non-attendance at the day hospital. Researchers did attempt to interview these patients in the community, but were often unsuccessful. The follow-up rate was 70% (145 out of 206) at 3 months, dropping to 57% (117 out of 206) after 12 months. This was primarily a result of the difficulty of contacting patients in a particularly mobile population. Losses to follow-up are summarised in Fig. 1.

Baseline characteristics

Baseline socio-demographic characteristics of the 206 patients are shown in Table 2. Baseline support costs (i.e. mean costs for the 3 months prior to admission) are given in Table 3. There were no statistically significant differences between patients randomised to day hospital or in-patient
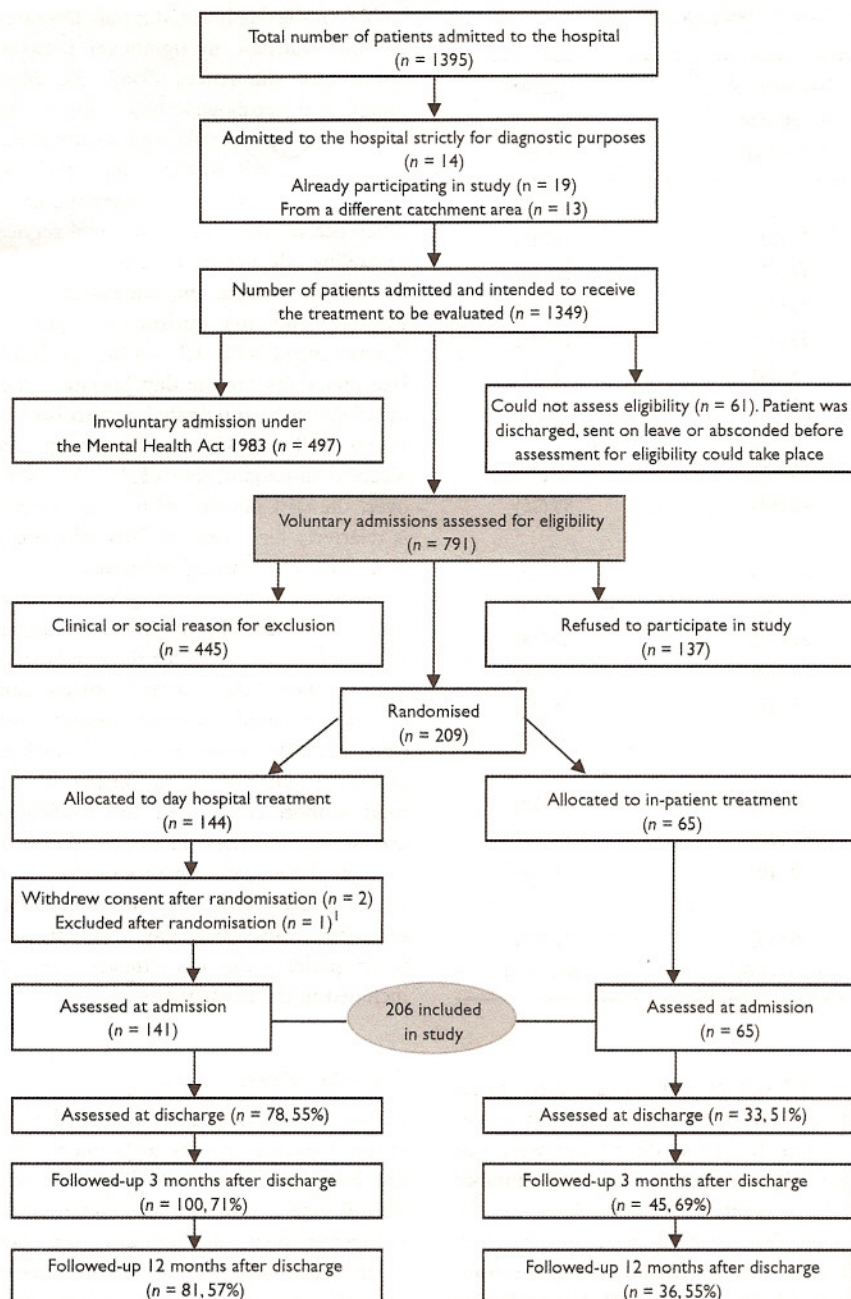
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┌─────────────────────────────────────────┐
│  Total number of patients admitted to the hospital  │
│              (n = 1395)                 │
└─────────────────────────────────────────┘
                    │
                    ▼
┌─────────────────────────────────────────┐
│  Admitted to the hospital strictly for diagnostic purposes  │
│              (n = 14)                   │
│  Already participating in study (n = 19)  │
│  From a different catchment area (n = 13) │
└─────────────────────────────────────────┘
                    │
                    ▼
┌─────────────────────────────────────────┐
│  Number of patients admitted and intended to receive  │
│  the treatment to be evaluated (n = 1349)  │
└─────────────────────────────────────────┘
          │                           │
          ▼                           ▼
┌──────────────────────┐  ┌──────────────────────────────┐
│ Involuntary admission under │ │ Could not assess eligibility (n = 61). Patient was │
│ the Mental Health Act 1983 (n = 497) │ │ discharged, sent on leave or absconded before │
│                      │ │ assessment for eligibility could take place │
└──────────────────────┘  └──────────────────────────────┘
                    │
                    ▼
┌─────────────────────────────────────────┐
│  Voluntary admissions assessed for eligibility  │
│              (n = 791)                  │
└─────────────────────────────────────────┘
          │                           │
          ▼                           ▼
┌──────────────────────┐  ┌──────────────────────────┐
│ Clinical or social reason for exclusion │ │ Refused to participate in study │
│              (n = 445)  │ │              (n = 137)    │
└──────────────────────┘  └──────────────────────────┘
                    │
                    ▼
┌──────────────────┐
│   Randomised     │
│   (n = 209)      │
└──────────────────┘
          │                           │
          ▼                           ▼
┌──────────────────────────┐  ┌──────────────────────────┐
│ Allocated to day hospital treatment │ │ Allocated to in-patient treatment │
│         (n = 144)        │  │         (n = 65)         │
└──────────────────────────┘  └──────────────────────────┘
          │
          ▼
┌──────────────────────────────────┐
│ Withdrew consent after randomisation (n = 2) │
│ Excluded after randomisation (n = 1)[1]   │
└──────────────────────────────────┘
          │
          ▼
┌──────────────────────┐   ┌──────────┐   ┌──────────────────────┐
│ Assessed at admission │──│ 206 included │──│ Assessed at admission │
│      (n = 141)        │   │ in study │   │      (n = 65)         │
└──────────────────────┘   └──────────┘   └──────────────────────┘
          │                                         │
          ▼                                         ▼
┌──────────────────────┐           ┌──────────────────────┐
│ Assessed at discharge (n = 78, 55%) │     │ Assessed at discharge (n = 33, 51%) │
└──────────────────────┘           └──────────────────────┘
          │                                         │
          ▼                                         ▼
┌──────────────────────────┐       ┌──────────────────────────┐
│ Followed-up 3 months after discharge │ │ Followed-up 3 months after discharge │
│      (n = 100, 71%)      │       │      (n = 45, 69%)       │
└──────────────────────────┘       └──────────────────────────┘
          │                                         │
          ▼                                         ▼
┌──────────────────────────┐       ┌──────────────────────────┐
│ Followed-up 12 months after discharge │ │ Followed-up 12 months after discharge │
│      (n = 81, 57%)       │       │      (n = 36, 55%)       │
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Fig. 1 CONSORT diagram. [1]Patient excluded from all analyses had not been discharged from the day hospital when the study period ended.

treatment in either baseline characteristics or baseline support costs.

Tests were also performed to determine whether patients lost to follow-up at each time-point differed from those interviewed. There were no significant differences in baseline characteristics (Table 2), baseline psychopathology or baseline subjective quality of life between patients interviewed and those lost to follow-up. There were also no significant baseline cost differences between patients for whom costs over the treatment period could be estimated and those for whom they could not.

Acute treatment

Patients randomised to the day hospital experienced a significantly longer admission than those randomised to the ward. The mean length of admission (including leave from the ward and days of non-attendance at the day hospital) for patients randomised to the day hospital was 55.7

days (s.d.=46.0, range 0–198) compared with 30.5 days (s.d.=35.6, range 2–175) for the ward group.

Several patients randomised to the day hospital had very short admissions and a few were not provided with acute treatment exclusively by the day hospital. After randomisation to the day hospital, some patients either stayed on the ward or returned to the ward after a very short stay at the day hospital. Several others required short or longer transfers to the ward during their stay at the day hospital. In line with an intention-to-treat analysis, all patients originally randomised to the day hospital were followed-up and treated in the analyses as part of the day hospital group. Figure 2 shows the actual acute treatment received by patients randomised to the day hospital and the flow between day hospital and ward. It is a reminder that the randomised controlled trial operated in a 'real world' situation. The use of in-patient facilities by day hospital patients is included in the cost analyses.

Outcome measures

Psychopathology

The day hospital patients ($n=76$) had significantly lower BPRS scores at discharge (mean score=1.63, s.e.=0.05) than the in-patient group ($n=30$, mean score=1.87, s.e.=0.09), indicating a greater improvement in overall psychopathology ($F=5.18$, d.f.=1, $P=0.025$, 95% CI 0.03–0.45). When entered as a covariate, length of admission did not have a significant effect on the BPRS score at discharge ($P=0.696$). There were no significant differences in psychopathology between the groups at either 3 months or 12 months after discharge.

Subjective quality of life

There were no statistically significant differences in the mean MANSA scores of the day hospital and in-patient groups at discharge and at 3 and 12 months after discharge. However, at discharge there was a trend towards greater subjective quality of life among the day hospital group ($n=71$, mean MANSA score=4.28, s.e.=0.11) compared with the in-patient group ($n=29$, mean MANSA score=3.87, s.e.=0.18; $F=3.29$, d.f.=1, $P=0.073$, 95% CI −0.85 to 0.04). When entered as a covariate, length of stay did not have a significant effect on the subjective quality of life at discharge ($P=0.977$).

Table 2 Baseline socio-demographic and clinical characteristics of the two patient groups

	Day hospital treatment (n=141)	In-patient treatment (n=65)
Diagnosis, n (%)		
Anxiety and depressive disorders	38 (53)	38 (25)
Bipolar affective disorders	13 (19)	11 (7)
Personality disorders	13 (18)	8 (5)
Psychotic disorders	22 (31)	32 (21)
Other	3 (4)	2 (1)
Unknown	11 (16)	9 (6)
Gender, n (%)		
Female	55 (77)	45 (29)
Male	45 (64)	55 (36)
Ethnic background, n (%)		
White British, White Irish or White other	55 (77)	54 (35)
Bangladeshi, Indian, Pakistani or other Asian	21 (29)	15 (10)
Black African, Black Caribbean or Black other	21 (30)	29 (19)
Mixed ethnicity	1 (2)	0 (0)
Other ethnicity	1 (2)	3 (2)
Unknown	1 (1)	0 (0)
Living situation, n (%)		
Living alone	33 (46)	42 (27)
Living with others	67 (95)	57 (37)
Unknown	0 (0)	1 (1)
Employment status, n (%)		
In paid employment	18 (26)	15 (10)
Age, years: mean (s.d.)	36.9 (12.0)	36.5 (9.4)

Treatment satisfaction

Mean CAT scores were significantly higher for the day hospital group (n=70) than the in-patient group (n=34) at discharge (8.10, s.d.=1.99 v. 6.77, s.d.=2.26; P=0.004; Table 4). At 3 months after discharge day hospital patients (n=79) were still more satisfied with the treatment they had received than those randomised to in-patient treatment (n=41) (mean CAT score=7.31, s.d.=1.93 v. 6.15, s.d.=2.48; P=0.005). At 12 months after discharge there were no significant differences.

Readmissions

Out of 65 patients randomised to the ward, 12% (8) were admitted one or more times in the 3 months after discharge compared with 19% (26 out of 140) randomised to the day hospital. (Note: data could be obtained for only 140 of the 141 individuals randomised to the day hospital.) When the time frame was extended to within 12 months of discharge, these figures rose to 26% (17 out of 65) of the ward group and 37% (52 out of 140) of the day hospital group, but these differences were not statistically significant. The mean number of days spent in readmissions in the 12 months after discharge was 70.6 (s.d.=78.6) for the day hospital group compared with 48.1 (s.d.=59.1), but again this was not statistically significant.

Costs

Total support costs over the treatment period could be estimated for 75 people in the day hospital group for whom at least one outcome measure was collected at discharge and 32 people in the ward group. For this sample, the mean treatment period, that is the time between admission to the ward or day hospital and discharge, was 25 days (s.d.=33, range 3–175) for the ward group and 67 days (s.d.=45, range 4–198) for the day hospital group. The proportion of people using community-based services tended to be higher for the day hospital group, but rarely did this translate to significant between-group cost differences (Table 3). Mean total support costs were higher for the day hospital group over the treatment period: £6523 v. £3619 (bootstrapped 95% CI 375–4511). The observed between-group difference for the costs of hospital services (including all in-patient admissions, day hospital attendance and out-patient visits) was large but not statistically significant (bootstrapped 95% CI −1185 to 2689). Hospital costs for the day hospital group are higher than anticipated, in part because nearly half (n=35) of this group also received in-patient care (Table 3). Moreover, the cost per day at the day hospital is relatively high (around 70% of the cost of a day on the in-patient wards).

Hospital costs accounted for nearly all costs (95%) for the in-patient group but 70% of the total costs for the day hospital group. For the latter, medication, community-based mental health and general health services, social care and legal services accounted for a further 4% of total support costs, with accommodation accounting for the remainder (26%). In these analyses, costs for services that were not actually used (e.g. accommodation costs for in-patients, day hospital costs when patients did not attend) were not included in the calculations.

Cost-effectiveness

In the simple cost comparison, the day hospital service appears to be more effective but more costly than in-patient care. This is not an uncommon finding when evaluating new interventions; but how much more expensive is day treatment? Cost-effectiveness was assessed by using the primary clinical measure (BPRS) to estimate the incremental cost-effectiveness ratio for the day hospital treatment group. This provides a measure of the additional cost of one extra unit of change in the outcome scale. As there were no significant differences in either costs or psychopathology at baseline, data for the treatment period were used. Using the total cost figure and the mean BPRS score at discharge, the total support cost per additional unit of output is £12 267. Using the partial cost measure, which includes only hospital services and was not significantly different between the groups, the figure is £3917. Translating this incremental cost-effectiveness ratio into a

Table 3 Service use rates and costs for 3 months prior to treatment and during the treatment period

Service	3 months pre-treatment					During treatment period				
	Day hospital (n=75)		In-patient ward (n=32)		P	Day hospital (n=75)		In-patient ward (n=32)		P
	n (%)	Cost, £: mean (s.d.)	n (%)	Cost, £: mean (s.d.)		n (%)	Cost, £: mean (s.d.)	n (%)	Cost, £: mean (s.d.)	
Accommodation[1]	75 (100)	2633 (751)	32 (100)	2650 (799)	0.918	75 (100)	1725 (1130)	13 (41)	59 (86)	<0.001
Hospital services		429 (886)		645 (1183)	0.303		4565 (3188)		3442 (5135)	0.172
In-patient[2]	20 (27)	394 (882)	11 (34)	590 (1158)	0.342	35 (47)	726 (1790)	32 (100)	3427 (5112)	0.006
Day hospital	0 (0)	0	0 (0)	0		75 (100)	3832 (2761)	0 (0)	0	<0.001
Out-patient/casualty	12 (16)	34 (72)	10 (31)	36 (58)	0.899	7 (9)	8 (24)	5 (16)	15 (39)	0.301
Day services[3]	22 (29)	108 (323)	5 (16)	44 (162)	0.178	0 (0)	0	0 (0)	0	
Community mental health service[4]	55 (73)	132 (231)	16 (50)	105 (168)	0.558	17 (23)	28 (158)	4 (13)	9 (30)	0.503
Medication	52 (69)	137 (249)	28 (88)	139 (235)	0.971	70 (93)	168 (251)	32 (100)	41 (63)	<0.001
Community health service[5]	57 (76)	40 (43)	21 (66)	164 (607)	0.268	28 (37)	10 (17)	5 (16)	4 (12)	0.060
Other support services[6]	12 (16)	46 (131)	3 (9)	20 (84)	0.315	12 (16)	19 (56)	5 (16)	13 (39)	0.633
Legal services[7]	12 (16)	16 (80)	8 (25)	97 (411)	0.285	5 (7)	3 (13)	5 (16)	50 (175)	0.139
Complementary therapies[8]	4 (5)	11 (61)	1 (3)	1 (8)	0.398	4 (5)	7 (40)	0 (0)	0	0.337
Total support costs		3578 (1283)		3916 (1648)	0.277		6523 (4277)		3619 (5213)	0.003

1. Includes staffed accommodation, bed and breakfast accommodation, domestic accommodation and associated living expenses. For people in the in-patient ward group, accommodation costs have been included where some days are recorded as being spent in their own home during the treatment period.
2. Includes psychiatric and general admissions.
3. Includes day services provided by public and independent sector organisations and education classes.
4. Includes care programme approach keyworker, care manager, community mental health team worker, psychiatrist, psychologist, community psychiatric nurse, individual or group counselling or therapy.
5. Includes nurse, occupational therapist, physiotherapist, general practitioner, practice nurse, dentist and optician.
6. Includes social worker, home care worker and family support.
7. Includes police, prisons, courts and forensic assessment.
8. Includes acupuncture, osteopathy and homoeopathy.

clinically meaningful index, improving the BPRS mean score by 0.1 points (the mean score at discharge was 1.62 and 1.88 in the day hospital and ward groups respectively) costs £1227 in total support costs or £392 in hospital costs; improving the BPRS score by 0.1 points amounts to a small effect size of 0.2 (based on the s.d. of the BPRS score at discharge of 0.5).

DISCUSSION

Day hospital treatment as an alternative to in-patient care

This study indicates that acute psychiatric day hospital treatment may be an effective and desirable, but more costly, alternative to conventional in-patient care. Day hospital patients had a significantly greater reduction in psychopathology at discharge and their subjective quality of life tended to be higher. However, this benefit did not persist 3 months after discharge, when patients were receiving treatment in the community again. Day hospital patients also reported significantly higher treatment satisfaction at discharge and retrospectively 3 months after discharge. The costs over the index treatment period were higher for patients in the day hospital and may have been even higher had informal costs been considered. The cost-effectiveness analysis shows that an additional investment of £1227 would have yielded an improvement of 0.1 points on the mean BPRS score. Such information provides planners and providers with further evidence on which to base their decisions about how to spend scarce resources. The actual acute treatment used by patients randomised to the day hospital (Fig. 2) also requires careful consideration by planners and providers – particularly the fact that a minority of day hospital patients required in-patient care at some point during their day hospital treatment.

Limitations of the study

There are two main methodological limitations of this study. First, although 44% (346 out of 791) of all voluntary patients had no social or clinical reason to be excluded and thus were regarded as eligible for day hospital treatment, only 60% of these patients (209 out of 346) gave consent to participate in the trial. Two further patients withdrew consent after randomisation. We do not know whether this rate of consent would have improved if day hospital treatment had been offered as a treatment alternative outside the context of a trial. Second, almost half of the randomised patients were lost to follow-up at discharge and 12 months after discharge, although the response rate at 3 months after discharge was more favourable. This may have introduced a selection bias, the influence of which must remain unclear. The randomisation procedure required all patients to be referred for and to accept in-patient care in order to be recruited to the study. We therefore missed two groups that in practice might be candidates for day hospital treatment: those patients who were sectioned because they did not accept in-patient referral, but might have agreed to voluntary treatment in the day hospital; and acute patients who were not referred because their clinicians, or they themselves, did not consider conventional in-patient care as appropriate.

Comparison with previous studies

Direct comparison with previous studies is difficult because they have used
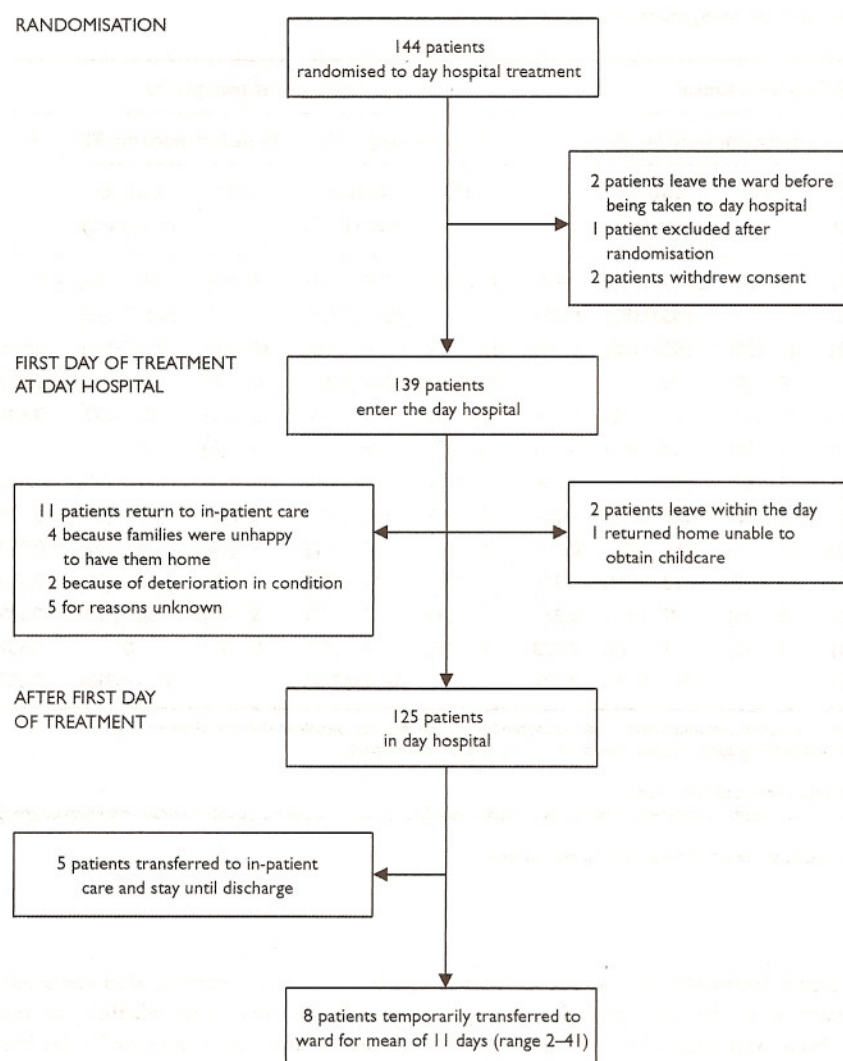
RANDOMISATION

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┌─────────────────────────────┐
│  144 patients               │
│  randomised to day hospital │
│  treatment                  │
└─────────────────────────────┘
           │
           │      ┌──────────────────────────────────┐
           │      │ 2 patients leave the ward before │
           ├─────▶│   being taken to day hospital    │
           │      │ 1 patient excluded after         │
           │      │   randomisation                  │
           │      │ 2 patients withdrew consent      │
           │      └──────────────────────────────────┘
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FIRST DAY OF TREATMENT
AT DAY HOSPITAL

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┌─────────────────────────────┐
│  139 patients               │
│  enter the day hospital     │
└─────────────────────────────┘
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┌──────────────────────────────────┐     ┌──────────────────────────────┐
│ 11 patients return to in-patient  │     │ 2 patients leave within the  │
│    care                           │◀───▶│   day                        │
│ 4 because families were unhappy   │     │ 1 returned home unable to    │
│    to have them home              │     │   obtain childcare           │
│ 2 because of deterioration in     │     └──────────────────────────────┘
│    condition                      │
│ 5 for reasons unknown             │
└──────────────────────────────────┘
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AFTER FIRST DAY
OF TREATMENT

```
┌─────────────────────────────┐
│  125 patients               │
│  in day hospital            │
└─────────────────────────────┘
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┌──────────────────────────────────┐
│ 5 patients transferred to in-     │
│   patient care and stay until     │◀───
│   discharge                       │
└──────────────────────────────────┘
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┌──────────────────────────────────────┐
│ 8 patients temporarily transferred to │
│ ward for mean of 11 days (range 2–41) │
└──────────────────────────────────────┘
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Fig. 2 Actual acute treatment received by patients randomised to the day hospital.

different time-points for evaluation and different outcome measures but where treatment satisfaction has been measured it has been higher in the day hospital group (Dick *et al*, 1985; Schene *et al*, 1993). Generally day hospital care has been as effective as in-patient treatment, but not more so (Dick *et al*, 1985; Creed *et al*, 1990; Schene *et al*, 1993; Sledge *et al*, 1996). This trial is unique in finding a statistically significant difference in psychopathology at discharge in those receiving day hospital treatment. The reasons for this difference remain unclear but may be related to differences between the day hospital models. One of the day hospitals studied was combined with a residential crisis respite centre, with the emphasis on flexibility compared with the relatively stringent model used here (Sledge *et al*, 1996). The other study only included outcome data on patients who attended the day hospital for more than 28 days (Schene *et al*, 1993).

The most recent randomised controlled trial of an acute day hospital found day hospital care to be cheaper than conventional ward treatment (Creed *et al*, 1997). In contrast, this study established higher costs for day hospital patients, or equivalent costs if only hospital services are considered. The model of day hospital treatment studied here might provide a more intensive service, with the resultant higher costs generating better patient outcomes than in other studies. This suggests the need for a fuller investigation of the

Table 4 Differences in psychopathology, subjective quality of life and treatment satisfaction between day hospital patients and in-patients

	Psychopathology (BPRS score)			Subjective quality of life (MANSA score)			Treatment satisfaction (CAT score)[2]		
	n	Adjusted mean	s.e.	*n*	Adjusted mean	s.e.	*n*	Mean	s.d.
Day hospital patients[1]									
At discharge	76	1.63*	0.05	71	4.28	0.11	70	8.10	1.99
3 months after discharge	98	1.70	0.05	93	4.31	0.09	79	7.31	1.93
12 months after discharge	82	1.61	0.06	76	4.46	0.11	62	7.26	2.16
In-patients[1]									
At discharge	30	1.87	0.09	29	3.87	0.18	34	6.77††	2.26
3 months after discharge	38	1.69	0.09	38	4.07	0.14	41	6.15††	2.48
12 months after discharge	36	1.66	0.09	34	4.46	0.16	26	6.72	2.42

BPRS, Brief Psychiatric Rating Scale; MANSA, Manchester Short Assessment Quality of Life; CAT, Client's Assessment of Treatment Scale.
*$P = 0.025$ (ANCOVA with baseline mean score and length of stay in days as covariates).
††$P < 0.01$ (*t*-test for equality of means, two-tailed).
1. Patients with more than 50% of items missing on a particular questionnaire were excluded from that particular analysis. For patients with less than 50% of items missing, mean scores were based on their existing data only.
2. For the CAT analyses only several patients randomised to the day hospital were treated as in-patients because they were actually treated in the ward rather than the day hospital. Therefore they could only comment on their ward experiences. This applies to four discharge interviews and three 3-month interviews. For all other analyses they were treated as part of the day hospital group in line with an intention-to-treat analysis.

association between interventions, costs and outcomes both at discharge and in the longer term. In addition, the day hospital rarely operated at full capacity during the study period because admission was restricted through the research protocol. If staffing remained constant and the day hospital were to work at full capacity, i.e. with 20 patients, the cost per patient day would be lower, thus reducing support costs, but there is no guarantee that it would also have achieved the additional effectiveness.

Range of care options

Acute day hospital models similar to the one studied here are feasible and effective alternatives to conventional in-patient care for a significant number of patients, although clearly only for a minority of all patients who are referred to in-patient treatment in a deprived East London Borough. Such a day hospital model, with an exclusive focus on acute treatment, might be an important addition to the range of treatment options within a modern community mental healthcare system (Priebe, 2002).

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CLINICAL IMPLICATIONS

■ A day hospital operating within a modern community mental healthcare system can be more expensive than conventional in-patient care if costs for non-hospital services are included.

■ Day hospital treatment is not only associated with higher patient satisfaction, but can also be more effective in reducing psychopathology.

■ Day hospital models similar to the one studied here may be an important addition to the range of acute treatment options within a modern community mental healthcare system.

LIMITATIONS

■ Although 44% of all voluntary patients were regarded as eligible for day hospital treatment, only 60% of these gave consent to participate in the trial.

■ The response rate at discharge was low at 54%. It was higher at further follow-ups but was still only 70% and 57% respectively.

■ The day hospital model assessed in this study was a special one, and it remains unclear whether and, if so, to what extent the findings can be generalised to day hospitals with different features and care models.

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REFERENCES

Beecham, J. (1995) Collecting and estimating costs. In *The Economic Evaluation of Mental Health Care* (ed. M. Knapp), pp. 83–102. Aldershot: Arena.

Beecham, J. & Knapp, M. (2001) Costing psychiatric interventions. In *Measuring Mental Health Needs* (2nd edn) (ed. G. Thornicroft), pp. 200–224. London: Gaskell.

Briscoe, J., McCabe, R., Priebe, S., et al (2004) A national survey of psychiatric day hospitals. *Psychiatric Bulletin*, **28**, 160–163.

Creed, F., Black, D., Anthony, P., et al (1990) Randomised controlled trial of day hospital versus inpatient psychiatric treatment. *British Medical Journal*, **300**, 1033–1037.

Creed, F., Mbaya, P., Lancashire, S., et al (1997) Cost effectiveness of day and inpatient psychiatric treatment. *British Medical Journal*, **314**, 1381–1385.

Dick, P., Cameron, L., Cohen, D., et al (1985) Day and full time psychiatric treatment: a controlled comparison. *British Journal of Psychiatry*, **147**, 246–249.

Horwitz-Lennon, M., Normand, S. L. T., Gaccione, P., et al (2001) Partial versus full hospitalisation for adults in psychiatric distress: a systematic review of the published literature. *American Journal of Psychiatry*, **158**, 676–685.

Marshall, M., Crowther, R., Almaraz-Serrano, A., et al (2001) Systematic reviews of the effectiveness of day care for people with severe mental disorders: (1) acute day hospital versus admission; (2) vocational rehabilitation; (3) day hospital versus outpatient care. *Health Technology Assessment*, **5**, 1–75.

Netten, A. & Curtis, L. (eds) (2002) *The Unit Costs of Health and Social Care*. Canterbury: Personal Social Services Research Unit, University of Kent.

Priebe, S. (2002) Making crises day services happen in practice. *Mental Health Times*, **1**, 12–13.

Priebe, S. & Gruyters, T. (1994) Patients' and caregivers' initial assessments of day hospital treatment and course of symptoms. *Comprehensive Psychiatry*, **35**, 234–238.

Priebe, S., Gruyters, T., Heinze, M., et al (1995) Subjective criteria for evaluation of psychiatric care. Methods for assessment in research and routine care. *Psychiatrische Praxis*, **22**, 140–144.

Priebe, S., Huxley, P., Knight, S., et al (1999) Application and results of the Manchester short assessment of quality of life (MANSA). *International Journal of Social Psychiatry*, **45**, 7–12.

Schene, A. H., van Wijngaarden, B., Poelijoe, N. W., et al (1993) The Utrecht comparative study on psychiatric day treatment and inpatient treatment. *Acta Psychiatrica Scandinavica*, **87**, 427–436.

Sledge, W. H., Tebes, J., Rakfeldt, J., et al (1996) Day hospital/crisis respite care versus inpatient care, Part I: Clinical outcomes. *American Journal of Psychiatry*, **153**, 1065–1073.

Ventura, J., Green M., Shaner, A., et al (1993) Training and quality assurance with the brief psychiatric rating scale: 'The drift busters'. *International Journal of Methods in Psychiatric Research*, **3**, 221–226.