



How effective are different types of day care services for people with severe mental disorders?

July 2005

ABSTRACT

This is a Health Evidence Network (HEN) synthesis report on the effectiveness of different types of day care services for people with severe mental disorders.

Day care is considered to be an important component of psychiatric services, but the evidence on different forms of day care is not easy to interpret. This review evaluates five main forms of day care for adults with severe mental disorders: acute psychiatric day hospital care, transitional psychiatric day hospital care, vocational rehabilitation programs (supported employment and pre-vocational training), day care centres and drop-in centres.

While the effectiveness of acute day hospitals is not in doubt, it is not clear that they have any advantages over other more radical alternatives to inpatient admission, such as crisis intervention and home-based care. However, it is conceivable that acute day hospitals might be most beneficial in circumstances where staff resources to deliver such crisis intervention or home based care are limited or where there is a need to deliver complex treatments.

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WHO Regional Office for Europe's Health Evidence Network (HEN)

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Summary

The issue

Day care is considered to be an important component of psychiatric services, but the evidence on different forms of day care is not easy to interpret. This review evaluates five main forms of day care for adults with severe mental disorders: acute psychiatric day hospital care, transitional psychiatric day hospital care, vocational rehabilitation programs (supported employment and pre-vocational training), day care centres and drop-in centres.

Findings

There is evidence to demonstrate the clinical effectiveness of acute day hospital care and the supported employment approach to vocational rehabilitation in those with severe mental disorders. When compared to inpatient care, patients in acute day hospitals spent less time in subsequent inpatient care and achieved more rapid improvement in mental state. There was also some evidence of reduced costs in acute day hospitals compared to inpatient care. Supported employment has been shown to be effective compared to pre-vocational training in American trials, helping patients with severe mental disorders to obtain competitive employment. This evidence was robust across a number of different trials, but no benefits in clinical outcomes were shown.

There is little evidence to support the effectiveness of pre-vocational training, transitional day hospitals or day care centres and no evidence from randomized controlled trials evaluating the effectiveness of drop-in centres.

Policy considerations

While the effectiveness of acute day hospitals is not in doubt, it is not clear that they have any advantages over other more radical alternatives to inpatient admission, such as crisis intervention and home-based care. However, it is conceivable that acute day hospitals might be most beneficial in circumstances where staff resources to deliver such crisis intervention or home based care are limited or where there is a need to deliver complex treatments.

Supported employment approaches appear promising and should be studied further in the European context.

Robust research regarding the cost-effectiveness of transitional day hospitals, day care centres and drop-in centres should be organized before new investment in any of these approaches is made.

Type of evidence

The evidence was drawn from systematic reviews of randomized controlled trials and supplementary individual randomized controlled trials published after the reviews were published.

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Introduction

The public health impact of mental illness is substantial, for example, the disability-adjusted life-years attributable to mental disorders in 2000 comprised 11.6% of total disability in the world (1). In affluent and developing countries alike, day care is becoming an important component of services for people with severe mental disorders.

“Severe mental disorders” and “day care” are both complex terms. For the purposes of this review, people with severe mental disorders will be defined as those suffering from:

- acute functional psychiatric disorder to a degree that would normally require inpatient care, or
- chronic functional psychiatric disorder to a degree that causes substantial social disability.

Hence this review **will not** be addressing day care for people with: substance abuse disorders, organic brain disease, personality disorders or eating disorders.

The term “day care” is not easily defined and is best clarified by first defining the functions of day care and then relating these to the various structures to provide them. Table 1 illustrates how day care for people with severe mental disorders can be understood in terms of these functions and structures. Day care for people with severe mental disorders has three main functions: to provide an alternative to inpatient care, shorten its duration and promote recovery and maintenance in the community. These three functions can be provided by day care programs from three different sources: day hospitals, employment services and social care facilities.

Day hospitals are hospital-based facilities capable of offering comprehensive psychiatric care, staffed by doctors, nurses and other health care workers. Employment services and social care facilities are community-based; they do not offer comprehensive psychiatric care and do not necessarily employ health care professionals. Within employment services the emphasis is on providing or obtaining work, whereas in social care facilities the emphasis is on support, companionship and activity.

Specialized forms of day care are provided to young people and older adults with severe mental disorders. These are beyond the scope of this review, which will be restricted to day care services for those from 18 to 65 years old.

The effectiveness of the five structural/functional combinations of day care described above will be evaluated in this synthesis.

Table 1. Classification of day care

STRUCTURE	FUNCTION		
	Alternative to inpatient admission	Shortening duration of inpatient stay	Recovery and maintenance
Psychiatric day hospital	Acute psychiatric day hospital	Transitional day hospital	Day care centre
Employment service			Vocational rehabilitation program (supported employment or pre-vocational training)
Social care facility			Drop-in centre

Sources for this review

The DARE Database of Abstracts of Reviews of Effects and the Cochrane Database of Systematic Reviews were searched up to the final quarter of 2004, using the search terms "mental disorder" [explode all categories] and "day" or "vocational" or "work" or "employ*". In addition, EMBASE, PsycInfo, and Medline were searched for reviews from 2003 to 2005 (the date of the latest systematic review from the Cochrane Library), in order to identify any new systematic reviews. This search proceeded by exploding the relevant MESH term for mental disorder and then running the search string [Day NEAR hospital OR care OR centre] OR [vocational OR employ* OR work], while restricting the search to reviews published from 2003 to 2005 inclusively.

The identified reviews were supplemented by any relevant, recently published, randomized controlled trials appearing in the Cochrane Central Register of Controlled Trials up to January 2005. These were identified using the same search strategy as used for Cochrane Reviews.

This synthesis did not include formal quality scoring. Instead, evidence sources were restricted to randomized controlled trials. Important features of the design and conduct of individual trials are discussed, outlining their impact on possible conclusions.

Findings

Alternative to inpatient admission: Acute psychiatric day hospital care

Acute psychiatric day hospitals were the subject of a systematic review published in the Cochrane Library in 2002 (2) that identified nine randomized controlled trials of day hospital versus inpatient care, published between 1964 and 1997 (3–11). No more recent systematic reviews were identified. No further randomized controlled trials were published, but one multi-centre European trial was in progress (12).

The trials in the systematic review (2) involved 2268 acutely ill patients with severe mental disorders who were assessed for suitability of acute psychiatric day hospital treatment. Of those, 1568 patients were randomized to acute day hospital care or inpatient admission. Two types of trials were included, but the methodological differences between them meant that they could not be analysed together. Type 1 trials excluded, before randomization, any patients who were considered ineligible for day hospital treatment (for being too violent or compulsive, for example). Type 2 trials randomized all patients presenting for admission to day hospital regardless of suitability.

The trials studied the use of hospital care in different ways: in terms of days in inpatient care, duration of day patient care, adjusted duration of day care (discounting weekends and days off), duration of index admission, nights out of hospital, actual attendances at day care, readmission to day care, readmission to inpatient care and so on. Furthermore, many of these outcomes arose from skewed distributions and were presented in forms (such as medians) that cannot be readily synthesized in a meta-analysis. It was therefore considered essential to obtain individual patient data from the included trials so that relevant outcomes could be derived and presented in a common format. The review obtained individual patient data from the four most recent trials, involving 594 people. In the other trials the data had either been destroyed or the trialists were not contactable. Details of follow-up periods and analyses are provided in Annex 1.

The systematic review assessed 18 outcomes, but most had sparse data and only the main effectiveness outcomes are reported here: 1) feasibility (including engagement), 2) extent of hospital care, and 3) clinical and social outcomes. Comparisons of the costs of care are presented in the chapter on costs and cost-effectiveness of this report.

Feasibility

The feasibility of day hospital treatment was defined as the percentage reduction in acute inpatient admissions that could be achieved by diverting patients to an acute day hospital. This involves determining the number of patients who were engaged in day hospital treatment and the number of patients assessed for eligibility. Both of these elements are subjective and so two methods of calculation were undertaken to give a best and worst estimate of feasibility for each trial, as outlined in Annex 1. The systematic review found that treatment in an acute day hospital was feasible for at worst 23.2% and at best 37.5% of patients currently admitted to inpatient care.

Extent of hospital care

The design of Type 1 trials permitted patients randomized to inpatient care to be discharged to day hospital care. Similarly, patients randomized to day hospital care could be subsequently admitted to inpatient care. The analysis of individual patient data from such trials showed no difference in the total number of days in hospital (combining day hospital days and inpatient days) between those randomized to acute day hospital care and inpatient controls (N=465; weighted mean difference -0.4 days/month). However, over the follow up period, the review found that patients originally randomized to day hospital care spent significantly more days in day hospital care (weighted mean difference 2.3 days/month) and significantly fewer days in inpatient care (weighted mean difference -2.8 days/month), when compared to controls randomized to inpatient care. However, looking at the data from all eligible trials (including some that did not provide individual patient data) readmission rates after the initial episode of care (day hospital or inpatient) were not significantly different between the groups (N=667).

Clinical and social outcomes

The effect of day hospital care on mental state and social functioning was investigated using a random effects model, a sophisticated approach that assesses the change in outcome for each patient over time and then allows comparison between treatment groups. Details of the modelling are presented in Annex 1. This analysis found a significant time-treatment interaction, suggesting that patients randomized to acute day hospital care achieved a significantly more rapid improvement in mental state (N=407), but there was no difference in social functioning (N=295).

Insufficient data were available to permit definitive conclusions about the effect of acute day hospital treatment on the number lost to follow up, employment, death, burden on carers or satisfaction with care.

Conclusions on acute psychiatric day hospital care

The review (2) concluded that acute day hospitals were a good alternative to inpatient care in areas where the demand for inpatient care was high and where facilities suitable for use as acute day hospitals already existed. However the review also pointed out the existence of effective alternatives to inpatient care – such as crisis teams – and noted that there were little data available on either the relative merits of acute day hospitals and crisis teams or the most effective ways of integrating acute day hospitals into a modern community-based mental health service.

Shortening duration of inpatient stay: Transitional day hospital care

The use of transitional day hospital care to reduce the duration of inpatient care was evaluated in a systematic review published in the Cochrane Library in 1999 and updated in 2000 (13). The review was principally concerned with the effectiveness of short-term versus long-term inpatient care for acutely ill patients with severe mental disorders. However, two of the four trials in the review used transitional day hospitals as the means of shortening inpatient stays (14,15). One of these trials experienced randomization and recruitment problems and did not provide any useable data (15). The other trial (14) took place in New York in the 1970s and reported results on 175 patients, recruited shortly after admission to an acute psychiatric hospital. Patients were randomized to three groups:

standard inpatient care, planned discharge by seven days after admission followed by day hospital care, or planned discharge followed by outpatient care. This trial stated that outcomes for the transitional day hospital group were no different from the inpatient group. However, the reporting of analyses in this trial is poor and it is unclear whether the main outcome of interest here, i.e. duration of inpatient stay, was assessed.

One further randomized controlled trial (16) was identified after the Cochrane review was last updated, concerned with the impact of transitional acute care for people on low incomes in rural areas of the United States. However, it made use of community-based transitional care and did not involve day hospital care as such, and so is not included in this review.

Four well-established scales were used to determine the effect on psychological functioning. These were analysed at three times, but dropouts were fairly substantial and no significant differences were found. In summary, there is insufficient evidence to permit definitive comments on the effectiveness of transitional day care in European settings.

Recovery and maintenance: Day care centres

A Cochrane review published in May 2001 (17) evaluated the effectiveness of day care centres for patients with severe long-term mental disorders, in order to determine whether day care centres reduced loss to follow up, improved clinical outcomes or reduced readmission rates. Day care centres were defined as "psychiatric day hospitals offering continuing care to patients with severe mental disorders". The review identified three randomized controlled trials (18–20) that met the inclusion criteria of having offered treatment in day care centres to people with severe long-term mental disorders (predominantly schizophrenia) who would otherwise have received outpatient care, with durations of twenty-four, eighteen and three months, respectively. Two of the trials (18,19) were conducted in American Veterans Administration Hospitals and were restricted to males. All were published prior to 1980.

Linn et al. (18) recruited patients with schizophrenia who had just been discharged from inpatient care (N=162). The intervention was care at one of 10 Veterans' Administration day care centres, which attempted to enhance social functioning by offering opportunities for socializing and participating in daytime activities. The centres employed social workers and doctors and also offered group therapy, counselling, and medication management. The control treatment was outpatient drug management from the centre doctors.

Meltzoff et al. (19) recruited patients "with a neuropsychiatric disability" who had spent time in hospital and were not suicidal or violent (N=80). The intervention was day care that included individual and group psychotherapy and medication management.¹ The control treatment was standard outpatient care.

Weldon et al. (20) recruited patients with schizophrenia who had recently been discharged from inpatient care and had no history of self-harm, violent behaviour or drug abuse (N=30). In this trial a majority of participants were female. The intervention included group therapy, medication and structured activities, while the control treatment was psychotherapy-oriented outpatient care with medication management. The systematic review found no significant differences between treatment and control groups in terms of the numbers lost to follow up and admissions to hospital.

Linn et al. (18) reported that day centre patients spent significantly fewer days in inpatient care over a 24-month period (day centre mean 78 days, outpatient mean 96 days). However, the numbers of

¹ The outcome data was not collected on an intention-to-treat basis, as patients who failed to engage in treatment were excluded from follow-up, as were those in hospital at the time of follow up. This trial therefore provided data only on numbers lost to follow up.

subjects included in this analysis were unclear and no significance levels or confidence intervals were reported. The same trial also reported significant improvements in mental state (Brief Psychiatric Rating Scale) and social functioning (Social Dysfunction Rating Scale) in the treatment groups. Again, the numbers of subjects and confidence intervals were not reported. The trial by Weldon et al. (20) found no significant differences on these outcomes, but this trial was substantially underpowered. Meltzoff et al. (19) did not analyse these outcomes.

The Cochrane review (17) concluded that there was insufficient evidence to judge whether day care centres were superior to outpatient care but that the quality of data reporting from the three trials providing data was not optimal.

The review of day care centres also identified a trial published in 1986 (21) in which time-limited day care centre treatment was compared to outpatient care for people who had just been discharged from inpatient care. This American trial represented a special short-term use of a day care centre (for 6 to 12 weeks) to prevent readmission by offering a place to socialize and engage in productive activities while receiving support from social workers and doctors. The control treatment consisted of outpatient medication management but no other aftercare. The trial found that significantly fewer participants in the short-term day care centre were lost to follow-up but there was no significant difference between groups in proportions admitted to hospital. Similarly there were no significant differences in overall functioning, mental state, or social functioning.

In summary, there was little evidence that day care centres were an effective means of helping patients with severe mental disorders to avoid readmission to inpatient care.

Recovery and maintenance: Vocational rehabilitation programs

A systematic review published in the Cochrane Library in February 2001(22) identified two main types of vocational rehabilitation programs for people with severe mental disorders: *pre-vocational training* and *supported employment*. The first offered trainees a period of preparation – work in a sheltered unit, or another form of pre-employment training or transitional employment – before attempting to place them in competitive employment (full-time or part-time employment in an ordinary work setting with payment at the market rate). The second placed service users in competitive employment without preparation, but provided on-the-job support.

The review (22) carried out three comparisons of community based vocational rehabilitation programs: pre-vocational training versus standard care, supported employment versus standard care and supported employment versus pre-vocational training. Standard care was defined as usual psychiatric care without any specific vocational component. The primary outcome for the review was number of clients in competitive employment. The review also reported other employment outcomes, clinical outcomes and costs.

Pre-vocational training versus standard community care

Five eligible trials were identified (23–27) for the comparison of pre-vocational training versus standard care, involving a total of 1204 service users in the United States. Beard et al. (23) compared the "clubhouse" model of vocational rehabilitation to standard community care. Dincin et al. (24) compared the "thresholds" program (work crews and transitional employment managed by the programme) to standard community care. Griffiths et al. (25) compared a rehabilitation programme involving industrial workshops to standard community care involving home support and day centres. Okpaku et al. (26) compared employment-oriented case management involving work assessment and employment preparation to standard case management. Wolkon et al. (27) compared individual counselling and transitional work to standard community care. Despite the trials having relatively large sample sizes, surprisingly limited data were reported. Data from two trials (23,25) were available on the proportion in competitive employment, one at 18 months (N=28) and the other at 24 months (N=215). Neither of these showed a significant difference between pre-vocational training and

standard care, nor between pre-vocational training and standard care on any other employment outcome.

Three trials (23,24,27) evaluated readmission to hospital. The meta-analysis of these studies (22) showed heterogeneity in the results (the effect of intervention differed among the three studies) and so a random effects analysis was performed to take this into account. This showed that fewer patients receiving pre-vocational training were admitted to hospital.

No other outcomes than a non-significant difference in self esteem in one small trial (25) were reported.

Supported employment versus standard community care

Only one randomized controlled trial (28), involving 256 participants, contributed data relevant to supported employment versus standard community care. In this trial supported employment was combined with assertive community treatment and compared against standard community care without assertive community treatment. In the primary outcome – numbers in competitive employment – the trial found no difference between supported employment and the control at 12 months (N=256), but there was a significant difference favouring supported employment at 24 months and 36 months.² Supported employment clients were also found to be more likely to be in any form of employment at 12 months and to earn significantly more per month (supported employment mean \$60.50, control mean \$26.90). There was no significant difference in the number of hospital admissions between supported employment and control. No data were available on other clinical outcomes.

Supported employment versus Pre-vocational training

Five randomized controlled trials (29–33), involving 484 patients, contributed data to the direct comparison of supported employment versus pre-vocational training. Bond et al. (29) compared supported employment with pre-vocational work-readiness training. Drake et al. (30) compared the individual placement and support model of employment with a brokered model of pre-vocational training, which emphasizes the integration of supported employment staff into existing mental health services. A second trial by Drake et al. (31) compared the individual placement and support model with pre-vocational counselling and work adjustment training in a sheltered workshop. Gervery et al. (32) compared supported employment with employment training in a sheltered workshop. McFarlane et al. (33) compared family-aided assertive community treatment plus supported employment with conventional pre-vocational training from local services.

The systematic review of these trials (22) found that on the primary outcome there was a statistically significant difference in favour of supported employment approaches at 4, 6, 9, 12, 15 and 18 months. For example at 12 months, 34% of clients were employed in the supported employment group, but only 12% in the pre-vocational training group. In terms of other employment outcomes, three trials found that clients in supported employment had significantly more hours per month in competitive employment than those receiving pre-vocational training. Three of four trials also found that supported employment clients had higher mean monthly earnings. In terms of clinical outcomes there were no significant differences between supported employment and pre-vocational training on overall functioning, self-esteem, mental state or quality of life.

Conclusions on vocational rehabilitation programs

Overall the Cochrane review (22) concluded that only supported employment was effective in helping those with severe mental disorders to obtain and keep competitive employment. It found no evidence that either supported employment or prevocational training led to improvements in clinical outcomes,

² This trial did not evaluate dropouts, it simply assumed that if no data were available at a time point the outcome was not achieved and hence undertook this rather simplistic analysis over time, with repeated significance testing.

although it noted that any positive effects of employment might have been masked by the fact that only one-third of participants in the more effective supported employment programs actually obtained competitive employment. In a sub-group analysis, the review concluded that the individual placement and support model was effective, but that there was insufficient evidence to determine whether it was more effective than less carefully specified approaches.

Additional randomized controlled trial on supported employment versus pre-vocational training

An updated search of the literature after the publication of the Cochrane review identified one completed randomized controlled trial (34) involving supported employment and one further systematic review and meta-analysis (35), which contained only one additional trial (34) and reached similar conclusions to the Cochrane review (22). Hence, only the details of the additional trial are reported here. Lehman et al. (34) studied 219 people with severe mental disorders who were assigned to supported employment (individual placement and support model) or pre-vocational training. At the two-year follow up, a higher percentage of participants from the supported employment program were in competitive employment than were those from pre-vocational training (27% and 7%, respectively). They also performed better on a range of other employment outcomes, thus confirming the conclusions drawn in other such studies.

Recovery and maintenance: Drop-in centres

A Cochrane review published in January 2001 (36) evaluated the effectiveness of drop-in centres to facilitate recovery and maintenance of long-term patients in the community. While the review used the term "day care centre", the function and structure of included studies corresponds to the term "drop-in centre" as defined in this review. The review identified no relevant randomized controlled trials. Even an updated search for this synthesis detected no further randomized controlled trials or reviews. In summary, there is no evidence on the effectiveness of drop-in centres from randomized controlled trials.

Evidence on costs and cost-effectiveness

Five randomized trials (2,3,5,6,8) comparing psychiatric day hospitals with inpatient admission, undertaken between 1985 and 1997, included cost data. In four of them, patients randomized to acute day hospital care showed cost reductions of 20.9% to 36.9% compared to those randomized to inpatient care, presumably as a result of receiving a greater part of their acute care in a less costly setting.

The review of day care centres (17) noted that there were insufficient data to compare their costs to those of standard outpatient care.

One American trial (24) of pre-vocational training versus standard care reported in 1982 showed that mean monthly total health care costs were lower for pre-vocational training than for standard care (\$417.90 versus \$651.50).

A 1966 American study (28) of supported employment combined with assertive community treatment versus standard community care reported that mean monthly health care costs were significantly higher for the experimental intervention (mean \$1599) than for standard community care (mean \$527). However, the former's combined nature makes interpretation uncertain. Furthermore, the use of standard significance tests on cost data may not be valid if the skew of the cost data has been taken into account.

Two trials (29,30) reported cost information for supported employment versus pre-vocational training, but they were somewhat equivocal. In 1986 Bond et al. (29) showed that the overall health care costs were lower for supported employment, while the 1996 New Hampshire trial by Drake et al. (30) found no significant difference in overall health care costs between the two approaches.

There were no data on costs related to transitional hospital care or drop-in centres.

Most trials that provided information on costs were undertaken in the United States, where the structures of hospital and social care and the labour market are quite different from those in many European countries. Furthermore, many of the trials are quite old and were undertaken when more inpatient care was provided to less severely ill patients. The applicability of these results to current clinical practice needs further investigation.

Ongoing projects

One European multi-centre trial (the EDEN project) is comparing psychiatric day hospital and inpatient treatment (12).

Two trials studying vocational rehabilitation programs have yet to publish full results. Meisler et al. (37) have randomized 144 participants in the United States to assertive community treatment plus supported employment (individual placement and support model) or to standard care from a community mental health centre. In the other trial, Mueser et al. (36) have randomized 204 participants to supported employment (individual placement and support model), pre-vocational training or standard services.

Discussion

Strength of evidence, gaps and conflicting evidence

This synthesis has only included systematic reviews of randomized controlled trials, so the evidence arises from well-designed studies. It may be argued that less rigorously designed studies could be included for the comparison of different forms of care, but as the authors of the review of day care centres (38) concluded “the inclusion of any studies less rigorous than randomized trials would result in misleading findings and that it is not unreasonable to expect well designed, conducted and reported randomized controlled trials of day centre care”. The authors also found that existing non-randomized comparative studies gave “conflicting messages”.

Randomization is one method used to reduce bias in studies; another is the use of blinding. Clearly for such different care programmes, interventions cannot be blinded, but assessments of outcome can be undertaken by a blinded clinician. However, discussion of such blinding is sparse and so assessment bias may be apparent in the results presented here.

Given the nature of mental illness, effective interventions have the potential to provide major social benefits for both the recipients and the community at large. The latter is difficult to study, but the former were studied in some reviews, with analyses of individuals' social functioning. However, as is common with such questionnaire outcomes, data were sparse and no differences were demonstrated among forms of care.

Generalizability

This review has studied patients with severe mental disorders using a definition that excludes people with substance abuse disorders, organic brain disease, personality disorders or eating disorders and so the results cannot be extrapolated to these groups of patients. Furthermore, the trials included were restricted to adults of working age (18–65) and cannot be generalized to children and adolescents or older people.

Some of the evidence is from older studies in the 1980s or even the 1970s (day hospitals) and may not reflect current treatment practices or alternatives. However, it is noted that for day hospital treatment, that exclusion of these older data did not substantially alter the conclusions of the systematic review in question.

Most of the trials were undertaken in the United States, where models of care might be quite different from those in Europe. More research is needed to prove the effectiveness of methods in European contexts, where the shift between hospital and community care is becoming increasingly important.

Summary and current debate

Acute Day Hospitals

The key issue in the current debate over acute day hospitals is whether they still have a worthwhile role compared to more radical alternatives to admission such as crisis intervention and home based care (38). The limited, indirect evidence suggests that day hospitals are not as effective in reducing admissions as home-based care (20.9% versus 55%), and in the absence of direct comparisons it seems reasonable to assume that they are also likely to be more expensive, given the infrastructure costs of day hospital care (39). On the other hand, in the right circumstances the acute day hospital could be more efficient than home-based care, since the former reduce the need for staff to travel and allow a single therapist to deliver a complex treatment to several patients simultaneously through group therapy. Where qualified staff are in short supply, this could be a considerable advantage. Consequently, there is a clear need for research that focuses on direct comparisons of acute day hospital care with other alternatives to admission, and explores their role in modern community-based psychiatric services.

Transitional day hospitals

There is insufficient evidence to support the use of day hospitals to reduce the length of inpatient stays. Since this is a common use of day hospitals, further studies should be commissioned, and the existing systematic review should be updated.

Vocational rehabilitation programs

There is strong evidence in favour of the supported employment approach to vocational rehabilitation, but little evidence to support the pre-vocational approach. In fact, of all community care interventions, supported employment would appear to be the one that most closely meets the expressed needs of mentally ill people and offers the best opportunity for reducing social exclusion and stigma (40,41). This evidence has not yet had the impact it deserves on mental health services; for example, in the United Kingdom pre-vocational training appears to dominate. However, there are still questions over how far the supported employment model can be implemented successfully outside the United States, where all trials have taken place. Some European countries' comprehensive welfare systems could deter service users from seeking work, because they would either be worse off or risk losing benefits. On the other hand, in less affluent countries the pressure to work might be so great as to render supported employment superfluous.

More sophisticated research is required on the contribution of work to recovery from psychosis. So far research in this area has been inconclusive, perhaps because even in supported employment programs only one-third of clients actually obtain work. An obvious direction for future research is to embed supported employment within an early intervention service for first episode psychosis.

Day care centres and drop-in centres

Day care centres have little evidence to support them and would appear to have little to offer compared to drop-in centres, which are likely to be cheaper since they do not generally employ clinical staff. Drop-in centres themselves have not been adequately researched and studies should be commissioned on the effectiveness of their different types.

Policy considerations

Although acute day hospitals have been shown to be effective, it is not clear that they have any advantages over other more radical alternatives to inpatient admission, such as crisis intervention or home-based care. However, it is conceivable that acute day hospitals might come into their own in circumstances where staff resources for crisis intervention or home-based care are limited or where there is a need for complex treatments. Supported employment approaches appear to be promising and more effective than pre-vocational training and should be studied further in the European context.

Robust research regarding the clinical and cost-effectiveness of transitional day hospitals, day care centres and drop-in centres should be undertaken before investing in any of them.

Conclusions

For patients with severe mental disorders, there is evidence of the clinical effectiveness of acute day hospitals as compared to inpatient care in terms of feasibility, more rapid improvement and significantly fewer days in subsequent inpatient care. However, readmission rates to either form of hospital setting did not differ between the groups and there were no differences in social functioning. There is some evidence of reduced costs for acute day hospitals compared to inpatient care, but no evaluations comparing costs and benefits. There is also no evidence comparing acute day hospital care with other alternatives to inpatient admission such as crisis intervention or home-based care.

The supported employment approach to vocational rehabilitation has been shown to be effective compared to pre-vocational training, helping people with severe mental disorders to obtain competitive employment. This effect has been replicated in a number of different trials and benefits have been demonstrated on a number of employment outcomes. However, no benefits were shown in terms of clinical outcomes and cost data are limited. Furthermore, the trials were all limited to the United States and are of uncertain generalizability.

There is little evidence to support the effectiveness of transitional hospital care or day care centres. There are no randomized controlled trials studying the effectiveness of drop-in centres. Further research into the clinical and cost effectiveness of these different forms of day care to treat those with severe mental disorders is needed.

Annex 1: Methodological details

Follow-up and patient numbers

The follow-up periods of the trials providing individual patient data were: 12 months (3,4); 10 months (6) for Type 1 trials and 24 months (5) for Type 2 trials. The follow up periods for trials included in the review, but for which individual patient data were not available were: 12 months (8), 24 months (7), 2 months (11) 1 and 6 months (10) for Type 1 trials and 24 months (9) for Type 2 trials. Some analyses took all available patients and analysed whatever data were available, others were restricted by those reporting an outcome at a particular time-period, hence the numbers available in the various analyses differ.

Calculation of 'feasibility' of day hospital treatment

The feasibility of day hospital treatment was defined as the percentage reduction in acute inpatient admissions that could be achieved by diverting patients to an acute day hospital. Feasibility was estimated by the formula: $100 \times \frac{\text{number 'engaging' in day hospital treatment}}{(\text{number 'assessed for eligibility' } \times R)}$, where R is the randomization ratio for the trial.

Estimates of feasibility are affected by judgements about what is "engagement" in day hospital treatment and how many patients have been "assessed for eligibility". So, two methods of calculation of feasibility were undertaken to give a best and worst estimate of feasibility for each included trial.

The best estimate of feasibility was based on defining "engagement" in day hospital as the number randomized to day hospital treatment, and "assessed for eligibility" as the number remaining after exclusions for administrative reasons.

The worst estimate was based on defining "engagement" as the number randomized to day hospital treatment (those admitted as inpatients in the first four weeks + the number of day patients who did not turn up for day hospital treatment), and "assessed for eligibility" as the number presenting for admission before any administrative exclusions were made.

A weighted average was derived for the best and worst estimates. However, this formula could not be applied to a minority of trials because all patients were admitted to inpatient care before randomization. For these trials a single estimate of feasibility was calculated, based on those patients randomized to day hospital care who experienced only a brief episode of inpatient care before transfer to a day hospital.

Random effects model of change in social and clinical function over time

Trials evaluated social and clinical functioning using a variety of instruments. The continuous scores arising from these instruments were combined and the effect of day hospital care compared to patient care was measured by a standardized (weighted mean) difference.

To test the effect of day hospital care on these standardized outcomes a random effects model was used involving the Type 1 trials. Curves describing the change in outcome over time were fitted to each subject using a multilevel regression model that took account of different lengths of follow-up. Random intercepts were considered to allow for individual variation among patients within treatment groups. An initial analysis was carried out to assess whether a random slope effect term needed to be included in the models. The average effect of treatment over time was expressed as a mean line for each treatment. The slope of the mean line for each treatment was compared and a treatment effect was measured by the time-treatment group interaction. To assess the effect of treatment, a full model with a time-intervention group interaction was compared with a reduced model excluding this term. Three covariates common to the included trials (age, diagnosis and sex) were included in the analysis.

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Annex 2: Glossary

day care centre	offers continuing care to patients with severe mental disorders
(acute) day hospital	provides diagnostic and treatment services for acutely ill patients who would otherwise be treated as psychiatric inpatients
drop-in centre	a non-clinical environment where people with mental disorders can go for social support and activities
pre-vocational training	a form of vocational rehabilitation that gradually prepares people with mental illness for employment
severe mental disorders	either an acute functional psychiatric disorder requiring inpatient care, or a chronic functional disorder causing substantial social disability
supported employment	a form of vocational rehabilitation that tries to place mentally ill people in real jobs without extended preparation
transitional day hospital	provides day hospital treatment on a time-limited basis to bridge the gap between hospital and out-patient care
vocational rehabilitation	a generic term for any treatment programme to help people with mental disorders find and keep employment; includes pre-vocational training and supported employment
N	number of patients/people included in a study

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Further information

The Cochrane Central Register of Controlled Trials is available in: *The Cochrane Library*, 2003, 3. Chichester, UK: John Wiley & Sons, Ltd.

Some of the systematic reviews referred to are available free of charge from the NHS HTA Programme website at <http://www.nchta.org.uk>. See for example: Marshall M et al. 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*, 2001, 5, no. 21.