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# The second deinstitutionalisation project for severely mentally ill patients in Kwai Chung Hospital: a randomised controlled trial

## Key Messages

1. A case management approach is an effective and cost-saving means of discharging chronic psychiatric patients to the community.
2. The discharged patients were well-maintained in terms of their mental state, quality of life, and willingness to stay in the community.
3. There was no increase in readmission rates in the treatment groups, and the increased discharge rate did not generate untoward social consequences (eg delinquency or violence).
4. Further rehabilitation services for the deinstitutionalisation movement should foster greater independent daily living skills in severely mentally ill patients.

## Introduction

Hong Kong has begun to strengthen the psychiatric rehabilitation service and shift in-patient services to community psychiatric services. There are concerns, however, that deinstitutionalisation may expose a lack of adequate and accessible community resources to meet the needs of discharged patients, and lead to unintended consequences like homelessness, crime, and a rise in hospital readmission rate.

In September 1999, Kwai Chung Hospital initiated a pilot deinstitutionalisation project—the Assertive Community Bridging Project (ACBP). It recruited 146 patients with lengths of stay (LOS) between 300 days and 5 years. Patients were offered a battery of rehabilitation programmes including a trial of the psycho-educational Pre-discharge Rehabilitation Education Programme (PREP) package delivered with a case management approach. After 1 year, 87 participants were discharged and successfully maintained in the community. They enjoyed better mental states, higher functioning levels, and an improved quality of life (QOL) [ACBP interim report 2000, unpublished data].

The ACBP was purely service-oriented. The participants were not randomised and no control group was assigned, so the conclusion that the project was probably effective could not be generalised. For this reason, this study was designed, putting emphasis on a thorough multi-disciplinary pre-discharge assessment, treatment planning, and mobilisation of medical and social resources. In particular, the study aimed to scientifically evaluate the efficacy of PREP and the Case Management Model, used as foundations for rehabilitation of patients in the ACBP.

This study aimed to: (1) examine the demographic, administrative, and clinical outcome data of chronic long-stay patients recruited into the project; (2) evaluate, using a randomised controlled trial design, the effects of the PREP programme over and above those achieved by a Case Management Model of care; and (3) compare outcomes of three groups given different management: the Case Management Model of care; case management plus a PREP programme, and a control group who received conventional rehabilitation services only.

## Methods

This study was conducted from October 2002 to September 2004. In the beginning, 352 in-patients of Kwai Chung Hospital who had been staying for more than 2 years were identified. The patients were excluded if they were over 65 years, had dementia, mental retardation or in a closed psychiatric ward, leaving 189 patients to be recruited to the project.

## Randomisation

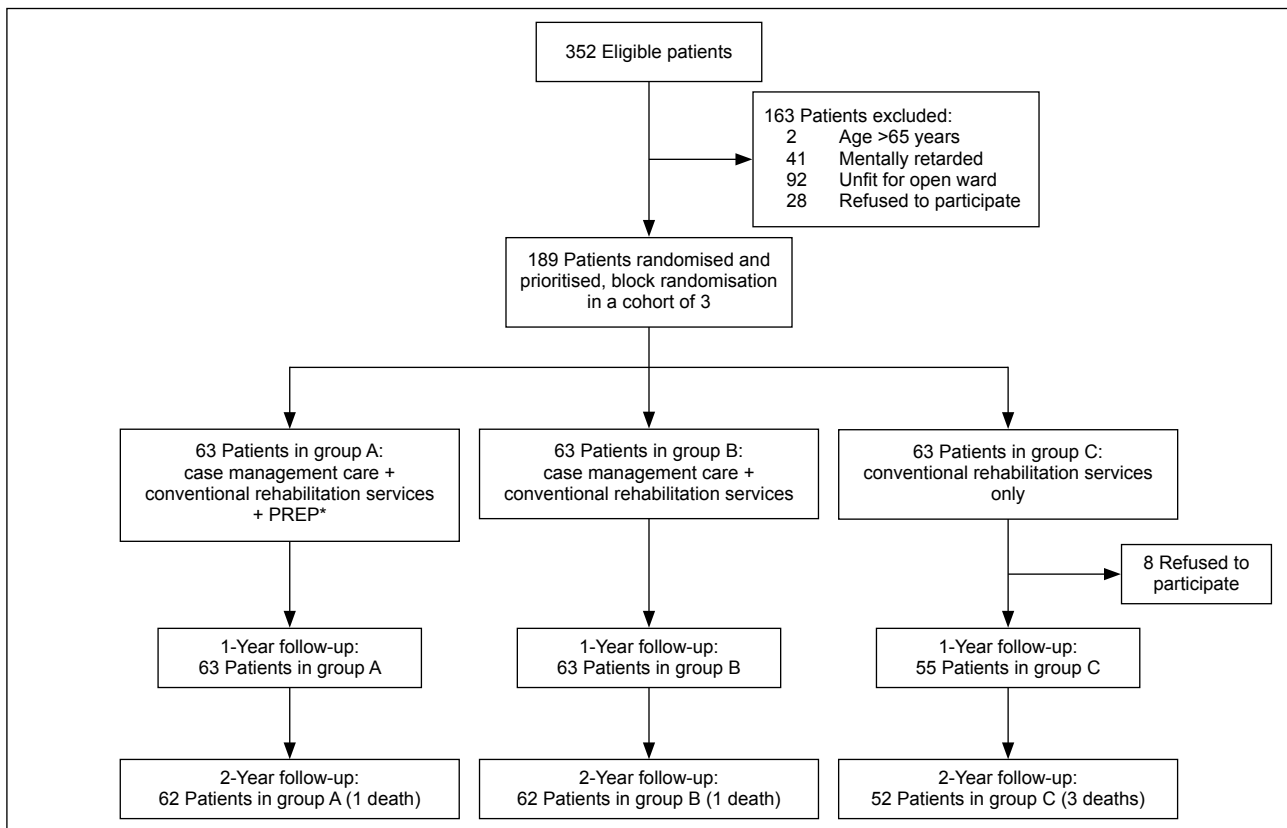
Subjects were identified and their written consent obtained. Each subject was randomised and prioritised according to the terminal two digits of their Hong Kong Identity Card number or the preceding two digits if these were identical.

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**Fig. Randomisation process**

\* PREP denotes Pre-discharge Rehabilitation Education Programme

The Central Nursing Department, which was independent of the research team, then randomly allocated subjects in cohorts of three according to the priority list. The subjects were randomly assigned to three groups (Fig)—group A: intensive case management care + conventional psychiatric rehabilitation services + PREP, group B: intensive case management care + conventional psychiatric rehabilitation services, and group C: control (conventional psychiatric rehabilitation programmes only). The participants allocated to the original rehabilitation programme were to be admitted to the project after all subjects in groups A and B had completed the 2-year rehabilitation programmes.

### Interventions

Participants received combinations of psychiatric rehabilitation programmes including occupational therapy, family work, community re-entry programme, supported living services, patient mutual support groups, day-patient services, medical social services, pre-discharge annex (a half-way house simulating a community setting), intensive case management care, and PREP. All programmes except the latter two were provided upon referral.

Intensive case management care involved assignment of a case manager (a community psychiatric nurse [CPN]) for pre-discharge assessment and planning, arrangement of an appropriate residential placement, and negotiation and

coordination with the non-government organisations running community rehabilitation services for care delivery before discharge, on top of conventional CPN tasks. The intensive case management care corresponded to a 3.18 compliance rating according to the Dartmouth Assertive Community Treatment Scale.<sup>1</sup> The subjects in treatment groups A and B received the intensive case management care for 2 years, irrespective of whether they were discharged or remained in hospital.

The PREP was a modified version of a pre-existing US psychosocial educational package adapted to the needs of Hong Kong schizophrenic patients.<sup>2</sup> The PREP consisted of multidisciplinary psycho-educational sessions targeting areas of potential handicap for chronic psychiatric patients.

### Measures and instruments

Measures included demographic data (sex, age, marital status, and education level), administrative and clinical data (diagnosis, age at onset of illness, duration of illness, LOS of index admission, number of previous admissions, and priority follow-up status), and outcome data (rate of discharge, rate of readmission, LOS in the mental hospital after readmission, criminal convictions, episodes of violence and aggression, and rates of suicide and attempted suicide). Clinical instruments used included the brief psychiatric rating scale (BPRS), the scale for the assessment of positive

**Table 1. Results after 2 years (intention-to-treat analysis)\***

Variables	Group A	Group B	Group C	Statistics	P value
No. of discharged/non-discharged (deaths)	44/18 (1)	54/8 (1)	18/42 (3)	$\chi^2=46.403$	0.000*
Total in-patient days per patient	431.44 ± 234.63	370.56 ± 215.83	610.86 ± 211.29	F=20.105	0.000*
Total day-patient days	19.33 ± 72.40	19.94 ± 69.22	4.29 ± 22.51	F=1.410	0.247
Total No. of visits by community psychiatric nurse	23.92 ± 17.29	28.11 ± 15.98	0.16 ± 1.26	F=77.31	0.000*
Total No. of out-patient attendances	6.35	7.43	2.03	F=15.15	0.000*
Total No. of readmissions (territory wide)	24	24	17	$\chi^2=2.298$	0.317
Total in-patient days after first discharge	78.05 ± 146.25	82.75 ± 144.33	84.92 ± 174.73	F=0.032, F=2.166	0.968
Median in-patient days	164	182.5	335	$\chi^2=3.676$ , df=2 (Kruskall-Wallis)	0.159
Mean episode of readmission	0.6349	0.8413	0.4603	F=0.946	0.39
Total in-patient days of 116 discharged cases	326.66 ± 184.84	323.24 ± 182.30	333.22 ± 217.75	F=0.019	0.981

\* Values are expressed as mean ± standard deviation, unless otherwise stated

symptoms (SAPS), the scale for the assessment of negative symptoms (SANS), and the World Health Organization Quality of Life Hong Kong Brief Version (WHOQOL-BREF[HK]), the specific level of functioning (SLOF), the patient attitude questionnaire (PAQ), the environmental index (EI), and the general health questionnaire (GHQ-12) used on family members looking after patients in the community.

### Cost-effectiveness analysis

We compared the cost-effectiveness of rehabilitation between groups using a cost-effectiveness ratio that was expressed as the difference in Hong Kong dollars on the cost side, and the difference in various outcome measures on the effectiveness side. We only considered the direct costs arising from each group including costs for in-patient and out-patient care, utilisation of the day hospital, community visits by the case manager, and drugs used. All unit costs were based on the mean cost across 3 financial years (from 2001/2002 to 2003/2004).

Clinical outcomes (including rate of discharge, in-patient days, re-admission rate, and mental state) and community functioning outcomes (including community tenure, QOL, employment status, level of functioning) were included in the analysis. Although the primary objective was to discharge long-stay patients, evidence of other benefits from these programmes such as enhanced QOL and improvements in mental condition were sought.

## Results

A total of 189 subjects were recruited and 63 subjects were assigned to each group (Fig). Most (95%) suffered from schizophrenia or related disorders. Nine (5%) had a diagnosis of bipolar affective disorder, personality disorder, or alcoholism.

The demographic characteristics were similar except that subjects in the control group had a higher level of education. The control group performed better (ie had lower scores than the treatment groups) in SAPS total score, bizarre behaviour, inappropriate affect subscales; the SANS total

score, and the alogia, avolition, anhedonia, attention, and personal care subscales of the SLOF. The other subscales of SAPS, SANS, SLOF, all QOL domains and BPRS were otherwise largely equivalent at the outset.

Eight control group subjects refused to participate after they had consented and been randomised. Four were eventually discharged from hospital. No subject dropped out from either treatment group.

The intervention was analysed on an intention-to-treat basis (Table 1). After 2 years, 44, 54, and 18 subjects had been discharged from groups A, B, and C, respectively. They had spent 431, 371, and 611 days in hospital, respectively, during the treatment period. As the treatment groups discharged more patients to the community, their in-patient and out-patient attendances and CPN visits were significantly greater.

Patients discharged from all groups spent similar times in the project before discharge, irrespective of the type of intervention. 24/44 (55%), 24/54 (44%), and 17/18 (94%) of those discharged from groups A, B, and C required re-hospitalisation, and the median LOS of their re-hospitalisation was 164, 182.5, and 335 days, which were not significantly different. One patient from each of groups A and B and three patients from group C died.

About half of the patients were discharged to private hostels, one quarter was discharged home and one quarter was discharged to a subsidised residence. Only two patients were reunited with family members.

### Psychometric outcomes

Repeated measures analysis of variance (ANOVA) were performed on the five psychometric tests administered at three times: upon admission to project (0 month), at 12 months and 24 months upon completion of intervention.

There were no significant differences in the BPRS score for all three groups after 2 years of treatment.

The subjects from both treatment groups showed

significantly greater improvement than the control group in many subscales of SAPS and SANS. There were significant changes in time effects on delusion, bizarre behaviour, positive formal thought disorder, inappropriate affect subscales, and the total score for SAPS, as well as the avolition, anhedonia, attention subscales, and total score in SANS. There were also significant changes in group effects in the SANS avolition subscale. Many of these changes also demonstrated significant time-by-group interaction effects. In other words, changes in SAPS and SANS depended on which group a participant was assigned.

There were improvements in the physical domain scores of WHOQOL-BREF(HK) in the treatment groups, but not in the control group. By contrast, the psychological health domain in the control group deteriorated. There was no difference between groups and within subjects in the social acceptability domain throughout the intervention period. The environment domain improved in group A, but deteriorated in group C.

The SLOF scores deteriorated in all subjects over time, especially in the total score, and personal care and interpersonal relationship subscales. The declines were greater in the control group.

Most relatives were either untraceable or refused to be involved in the rehabilitation programmes or assessment. Only 23 subjects were discharged home; one lived with her husband and one with parents; the others lived alone. Further analysis of GHQ parameters was not possible.

The hospital version of the PAQ was completed by 62 of the 68 non-discharged patients in the three groups. Thirty-six patients (significantly more from the control group) indicated a strong or qualified desire to leave hospital, and 13 preferred to remain in hospital (Table 2a). The community version of the PAQ was completed by 84 of the 116 discharged patients. To item 6, which enquired "which place do you like better, here or hospital?", 64 said they preferred to stay in the community, and only four preferred to go back to hospital (Table 2b).

Of the 169 subjects, 116 were ultimately discharged. Altogether, 35 had their residences assessed with the EI. A lower EI score was associated with higher autonomy in the setting. We found that singleton hostels were least restrictive, followed by long-stay care homes, halfway houses, care and attention homes, open wards (hospital), closed wards (hospital), and community private hostels were rated the most restrictive. This surprising finding occurred because the private hostels scored highly due to their rural location.

### Cost-effectiveness analysis

The total number of in-patient bed days was obtained from the Clinical Data Analysis and Reporting System of the Hospital Authority. For in-patient care, out-patient care,

**Table 2a. Hospital version of patient attitude questionnaire (Q8: desire to leave hospital)\***

Group	Prefer to leave hospital	Ambivalent	Prefer to remain in hospital	Total
A	7	5	4	16
B	3	4	0	7
C	26	4	9	39
Total	36	13	13	62

\*  $\chi^2=10.325$ ,  $df=2$ ,  $P=0.035$

**Table 2b. Community version of patient attitude questionnaire (Q6: which place do you like better: here or hospital?)\***

Group	Prefer community	Prefer hospital	Total
A	22	1	23
B	31	3	34
C	11	0	11
Total	64	4	68

\*  $\chi^2=1.317$ ,  $df=2$ ,  $P=0.506$

day-hospital attendance, and community visits by case managers, the unit costs were based on the specialty costs of Kwai Chung Hospital from 2001 to 2004, which were HK\$1405, HK\$717, HK\$874, and HK\$1011, respectively. With the introduction of costly atypical anti-psychotic drugs, the cost of medication utilisation may influence cost-effectiveness. The total costs of medication utilisation in the three study groups during the 2-year study period were collected (via Clinical Data Analysis and Reporting System).

Statistically significant differences were found between groups in costs in the areas of in-patient care, out-patient care, and community visits. Group B, with a mean cost of HK\$ 571 802 per patient, was the cheapest treatment model. As the number of hospital bed days contributed more than 90% of the overall costs, reduction in bed days significantly reduces overall costs. Group C, with a mean of 611 bed days, was the most expensive model.

### Study limitations

Staff managing the two treatment groups were not blinded to the subjects' status. Although this study was not intended to be a double blind/placebo trial, this a priori knowledge might make staff in the treatment team employ more aggressive tactics, for example, to use atypical anti-psychotic medications more liberally or to discharge patients earlier.

The PREP employed in this study was a stepped-down version of the original programme proposed by Boyd et al.<sup>2</sup> This was mainly due to resource restriction and the fact that as subjects were recruited in different phases of rehabilitation, it was not feasible to deliver the full 8-month psycho-educational package to those patients who had already achieved sufficient potential for early discharge.

Some of the instruments used had not been pilot-tested by the research group, resulting in an inappropriately low

return of GHQ data and inconsistent findings in some of the PAQ and EI items.

## Discussion

Our study demonstrated that case management and a psycho-educational package allowed more patients to be discharged to the community, and achieved that result more cost-effectively. Although the revolving door phenomenon did occur, only 21 of the 65 patients were admitted more than once. Moreover, a higher discharge rate in the treatment group did not generate a higher readmission rate, or a longer LOS during readmission.

Only 21 patients returned home, and two of these were reunited with their families. The long index admission and period of illness, frequent relapses, and repeated readmissions probably contributed to this rejection by family members.

There was only one conviction for physical assault and no reports of attempted suicide. This is contrary to overseas reports of criminal convictions after deinstitutionalisation. This may be because our population was older and more chronically ill, and had 'burnt-out' symptoms. A pre-discharge assessment and very close follow-up of discharged patients may have contributed.

Half of the discharged patients resided in a private hostel and the quality of these residences varied. Successful discharge of patients into the community does not mean independent living within the community. Although the treatment groups had a higher discharge rate, and perhaps some improvement in mental state, these improvements were not seen in their QOL. The level of functioning scores deteriorated in all groups during the 2-year intervention. Our intervention did not prevent degeneration in daily functioning. Most were discharged to halfway houses and

hostels that do not foster independent living skills. We suggest that further rehabilitation should be directed to this area to prevent development of further handicaps and maximise their potential to settle into a new home.

Nevertheless, most preferred their present community style of living to hospital living, and a large proportion of the non-discharged patients in the control group indicated a desire to leave hospital.

Overseas studies have found, as in our study, that assertive community treatment improves clinical and community outcomes without imposing additional costs.<sup>3,4</sup> Our study suggests that case management should be an important element in the rehabilitation of long-stay psychiatric in-patients.

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