Comprehensive psychiatric rehabilitation for severely disabled patients must incorporate both biological and behavioral-psychosocial treatment approaches, applied over time in a range of community and institutional treatment settings.

Prescriptive Rehabilitation for Severely Disabled Psychiatric Patients

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Schizophrenia is a complex disease with numerous models describing etiology, phenomenology, and treatment. Two research agendas dominate. Biological approaches focus on neurochemistry and anatomy, whereas psychological approaches emphasize environmental stressors, diminished social and coping skills repertoires, and limited support systems. Psychiatric rehabilitation has been defined as the facilitation of the physical, emotional, and intellectual skills needed to live, learn, and work in the community (Anthony and Liberman, 1986, p. 542). However, the refractoriness of a large number of patients requires the implementation of rehabilitative methods based on the breadth of knowledge regarding schizophrenic functioning and deficits. Such an integrative approach can be achieved only through an interaction of both biological and environmental agendas.

The stress-diathesis model integrates physiological and behavioral aspects of schizophrenia (Nuechterlein and Dawson, 1984a; Zubin and Spring, 1977). As a result of genetic anomalies (Gottesman, McGuffin, and Farmer, 1987), persons with schizophrenia develop a range of psy-
chophysiologial and cognitive deficits that typically emerge in subclinical form during adolescence or young adulthood. Persons with schizophrenia demonstrate anomalous functioning on smooth-pursuit eye movement tasks, conduction of electric current through the skin, EEG alpha activity, heart rate, and blood pressure (Dawson and Nuechterlein, 1984). Skin conductance, heart rate, and blood pressure findings suggest that persons with schizophrenia suffer from aberrant arousal patterns, which may contribute to their hypersensitivity to stress.

Numerous information-processing deficits have been identified as well. Limits in functioning have been identified in sustained attention (Nuechterlein, 1977), iconic memory (Sacuzzo, 1986), long-term recall (Koh, 1978), and response selection (Bronen, 1968). Nuechterlein and Dawson (1984b) have explained these dysfunctions in terms of Kahneman's (1973) finite-capacity view of information processing, suggesting that persons with schizophrenia have insufficient capacity for allocation to appropriate cognitive stages to sustain normal information processing. Aberrant arousal patterns may exacerbate deficits in information processing, since available capacity sharply declines in hyperaroused states (Gjerde, 1983).

The combination of diminished cognitive capacity and tonic aroused states is likely to accelerate vulnerability to environmental stress such that an increase in psychotic symptoms results when the low stress threshold is exceeded. Relapse is closely associated with a stressful life experience in the weeks before symptom exacerbation (Birley and Brown, 1970; Brown and Birley, 1968; Brown, Harris, and Peto, 1973). Furthermore, these stressful experiences are not clearly independent of the influence of the disease (Lukoff, Snyder, Ventura and Nuechterlein, 1984). Low tolerance for stress and periods of acute symptomatology combine to increase the frequency and severity of stressful life events. For example, Brown and Birley (1968) found that 40 percent of their patient sample were involved in legal proceedings, made long-distance moves, or changed jobs in the period prior to relapse.

Biological vulnerabilities and environmental response to stressors interact to affect the patient's repertoire and support network. Poor cognitive abilities are likely to impede sufficient acquisition of social and coping skills during prodromal years. As a result, the patient may be more exposed to social stressors and unable to accomplish instrumental goals. The combination of diminished coping skills and physiological sensitivity to arousal promotes avoidance of mildly stressful social situations. Similarly, the volatile course of the disease typically brings about estrangement from family, friends, neighbors, and co-workers, thus depriving the individual of an important 'stress buffer.'

The stress-diathesis model suggests that rehabilitation research and treatment requires interaction of biological and psychological views of
merge in subclinical symptoms with schizophrenia. Eye movement pursuit eye tracking the skin, EEG and Nuechterlein, etc. findings suggest arousal patterns. It has been identified as sustained attention over a long-term recall. Nuechterlein and Dawkins of Kahneman's, suggesting that the allocation to attention processes is determined by the context of previous arousal states and tonic arousal states. Low stress threshold life experience and Brown, 1970, 75. Furthermore, if the influence of 1984). Low tolerance to increase example, Brown et al. sample were aware of, or changed. Response to stressors is a hallmark of social and personal change. Poor cognition of social and personal change may be instrumental and physiological. Social situations bring about changes, thus depriving research and logical views of the illness. In support of this model, drug and psychosocial treatment have been found to have synergistic effects (Falloon and Liberman, 1983; Liberman, Corrigan, and Schade, 1989). In one study, drug therapy reduced hospitalization rates to 41 percent; social skills training added to neuroleptic administrations reduced rates to 20 percent. When social skills training, behavior family management, and drug therapy were combined, none of the patients were found to be hospitalized at follow-up (Anderson, Reiss, and Hogarty, 1986).

Implications for Rehabilitation

A comprehensive, biological-psychosocial treatment approach can be described by means of a decision tree for the clinical management of schizophrenic patients (Liberman, Falloon, and Wallace, 1984). In this empirically informed approach, illustrated in Figure 1, patient characteristics and treatment needs provide a rationale for applying a broad range of psychosocial and neuroleptic drug interventions. Initial treatment efforts emphasize stress reduction, supportive use of the environment, and pharmacotherapy directed toward alleviating florid psychotic symptoms, particularly those that interfere with the patient's capacity to process information, voluntarily collaborate in treatment planning, and actively engage in psychosocial rehabilitation.

A tiny subgroup of patients may benefit from a drug-free trial of treatment. However, candidates for drug-free treatment of schizophrenia should pass a highly restrictive set of screening criteria, including having a first acute onset of symptoms with prominent affective components and clear precipitating events; having good premorbid social and occupational adjustment; living with relatives who are high in expressed criticism and hostility; being free of paranoid ideation; having realistic, integrative, and insightful attitudes regarding schizophrenia; and reporting dysphoric subjective response to a test dose of a neuroleptic, which may predict poor compliance with medication (Liberman, Falloon, and Wallace, 1984). For most patients, initial treatment will include neuroleptic drug therapy combined with goal-oriented, practical psychosocial treatment aimed at crisis intervention. Whether or not the initial, ordinarily brief (two-week to two-month) period of acute treatment takes place in a hospital, day treatment center, home-based setting, or other community setting will depend on the availability of nonhospital settings and resources and the supportive capacity of the family (Liberman, Falloon, and Wallace, 1984).

When the patient is relatively free of acute positive symptoms and cognitive dysfunction, a flexible psychosocial rehabilitation program can be instituted, in conjunction with continued administration of judicious doses of maintenance antipsychotic medications. Rehabilitation programs...
Figure 1. Decision Tree for Clinical Management of Schizophrenia: Drug and Psychosocial Treatment Strategies
are graded, long-term, and aimed at remedying those behavioral deficits that remain after remission of florid symptoms. Rehabilitation also promotes drug compliance, with the goal of enabling patients to live in the community for longer periods of time without symptom exacerbation or rehospitalization.

For the approximately 60 to 70 percent of patients who remain in relative remission for one year after their last relapse and hospitalization, an important clinical decision becomes how long to continue medication. Recent studies found that remissions lasted longer among patients maintained on long-acting depot neuroleptics than among those maintained on oral medications, suggesting that long-term compliance with medication is an important element in rehabilitation (Hogarty and others, 1988). Combining behavioral training of patients in appropriate long-term use of antipsychotic medication—including knowing the benefits, side effects, techniques of self-administration, and how to negotiate medication issues with health care providers—can foster better outcomes from maintenance therapy (Eckman, Liberman, Phipps, and Blair, 1989). It is becoming increasingly apparent that neuroleptic drugs delay but rarely prevent relapse; hence, clinicians might consider lowering dose levels during maintenance periods in an effort to reduce the hazards of tardive dyskinesia and other long-term side effects (Liberman, Falloon, and Wallace, 1984). Moreover, one strategy that can compensate for the symptom breakthroughs experienced by patients on low-dose neuroleptic therapy involves teaching them skills of symptom self-management. This requires training patients to identify early signs of relapse as warning signals and to develop their capability to seek early intervention before full-blown relapse occurs (Wirshing, Eckman, Marder, and Liberman, 1989). For refractory patients who do not respond optimally to somatic and rehabilitative treatments, longer-term placement in an intensive, residential behavior therapy program may yield better ultimate outcomes (Paul and Lentz, 1977).

Rehabilitation Interventions

Rehabilitation strategies improve the patient's independent functioning through acquiring skills and strengthening behavioral repertoires (Wallace and others, 1980). Other rehabilitation strategies compensate for functional deficits by providing social prostheses in the form of case managers, supported employment, residential care homes in the community, or interdisciplinary rehabilitation teams (Liberman, 1987; Stein and Test, 1978; Test, 1984, 1989). Choosing appropriate rehabilitation strategies is based on the assessment of patients' deficits. Thus, lack of social competence, conversational skills, and instrumental role skills should lead to social and life skills training; relationships with family members
who are high on expressed emotion and in families in which tension is high and problem solving low should trigger educational and behavioral approaches to family therapy; and lack of occupational skills indicate the need for vocational rehabilitation (Falloon and Liberman, 1989). The remainder of this chapter reviews the manner in which behavioral rehabilitation methods—based on skills training or social support—can be used in community and inpatient settings.

Inpatient Social Learning Programs. For chronic schizophrenic patients with severe deficits that prevent community tenure, an intensive behavior-therapy program, such as a ward-wide token economy and social learning program, may be appropriate. Paul and Lentz (1977) developed and evaluated a comprehensive social learning program for severely disabled schizophrenic patients. This program employed a highly specific token economy and many hours of structured educational activities throughout the day. Patients were positively reinforced with praise and tokens for productive, appropriate behavior (for example, cleaning rooms, attending classes, and grooming) and were fined tokens, ignored, and/or placed in time-out for inappropriate behavior such as yelling or assaulting. They could exchange tokens for back-up reinforcers such as consumables and privileges. Patients were held accountable for their behavior and were provided with training in social skills to equip them for community living.

Paul and Lentz (1977) randomly assigned eighty-four long-term, schizophrenic patients to state hospital units that use social learning, milieu therapy, or traditional custodial care approaches. A multimodal assessment battery, including reliable time-sampled behavioral observations, revealed impressive and clear-cut results favoring the social learning approach. Improved functioning, enabling long-term community tenure, occurred in 97 percent of the social learning patients. The therapeutic milieu program was less effective, but its 71 percent release and community-maintenance rate was still a favorable outcome when compared to the 45 percent rate of patients released from custodial care and living in the community for eighteen months or longer. An important characteristic of the social learning program was that it was clearly the most cost-effective program when decreased need for hospitalization was included in cost calculations.

The apparently outstanding success in sustaining patients in the community was mirrored by significant clinical and behavioral improvements that produced a minority of patients who could not be distinguished from a normal population. After only fourteen weeks of treatment, every resident in the social learning program showed dramatic improvements in overall functioning, regardless of usual prognostic indicators such as duration of hospitalization and pretreatment level of impairment. Moreover, by the end of the second year of programming,
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fewer than 25 percent of residents in either experimental condition required maintenance psychotropic drugs.

A similar social learning program is located at the Clinical Research Unit (CRU) at Camarillo State Hospital, the longest-running token economy in any residential psychiatric facility. Treatment-refractory and severely impaired patients are referred to the CRU when standard hospital programming proves ineffective. There they are provided with training in personal grooming, social skills, room clean-up, and appropriate meal behavior. Special programs are developed for each patient's unique behavioral problems as well, thus increasing the likelihood of discharge (Liberman, Wallace, Teigen, and Davis, 1974). Most of the patients' days are structured with specific activities and frequent training sessions. Special attention is paid to helping patients learn to pursue recreational activities and other structured activities, and participation in such structured activities has been shown to reduce patients' bizarre behavior (Liberman, Wallace, Teigen, and Davis, 1974; Polsky and McGuire, 1981; Rosen and others, 1981; Wong and others, 1987; Wong and others, 1988).

Behavioral interventions developed at the CRU have been successful in increasing social skills in chronic schizophrenic patients (Massel and others, 1985), in controlling aggressive behavior in treatment-refractory schizophrenic patients and in those with other disorders (Clyn and others, 1987), and in reducing delusional speech among schizophrenic patients (Liberman, Teigen, Patterson, and Baker, 1973). During its eighteen years of operation, 42 percent of the patients referred to the Unit as refractory and requiring more intensive treatment have been discharged into the community, with half of them being successfully maintained in the community for six months to five years after discharge (Banzett, Liberman, Moore, and Marshall, 1984).

Community Support Programs. As illustrated in the decision tree in Figure 1, community support programs are necessary for providing comprehensive rehabilitation services. They can be the focus for skills-building efforts close to patients' natural living and working environments, and are important for maintaining gains made in social skills training, behavioral family therapy, and vocational rehabilitation. Comprehensive rehabilitation strategies must follow patients from the hospital to the community. Skills training modules—comprising training manuals, patient workbooks, and demonstration videos—are an example of a portable and replicable rehabilitation modality that can be used in hospital and community settings, thereby serving as functional bridges for patients moving through the continuum of care (Eckman, Liberman, Phipps, and Blair, 1989).

Community support programs are often as effective as inpatient treatment in reducing symptomatology without increasing the burden on the family or neighbors (Test, 1984). Moreover, patients are often more satis-
fied with (Polak, 1978; Test and Stein, 1978) and function at greater levels of independence in such programs (Mosher and Menn, 1978; Stein and Test, 1980).

Movement through community programs should depend on incremental skills acquisition and meeting performance criteria such that social functioning ultimately approaches "normal" levels. Although research has shown that as few as three or four training sessions improve interpersonal functioning (Goldstein and others, 1973; Goldsmith and McFall, 1975; Liberman, Nuechterlein, and Wallace (1982) have suggested that several years of training may be necessary to achieve significant impact on long-standing disabled lifestyles. Criteria for placement into more demanding programs should depend on the patient/trainee exhibiting mastery of the skill. Regardless of the duration of training, only when the individual is able to perform the behavior at criterion level in real-life situations can it be assumed that skills are acquired and training is no longer necessary.

Rehabilitation programs rely on (1) educational strategies to improve the patients' skill repertoire and (2) support services to bolster their limited interpersonal network (Anthony and Liberman, 1986). The token economy and social skills training methods used within inpatient settings apply to community social learning programs as well. Social skills training is a generic category whose training techniques are applicable to improving a wide range of interpersonal and instrumental skills (Christoff and Kelly, 1985). The number of skill modules comprising community-based social learning programs is likely to be larger than the available curricula within the hospital. Patients' instrumental and interpersonal goals increase sharply and become more imminent when they move from the hospital to the community. In addition, the community settings available to patients participating in support programs offer greater opportunity for generalization of skills.

Community programs incorporate case management strategies to augment social support networks, link patients with needed services, and advocate for patients' needs. In this way, community support systems assume some responsibility for providing a stress buffer to life events. Test (1979) identified cross-sectional and longitudinal factors that guide case management. In cross-sectional services, case managers ensure that the multitude of agencies available to the patient actually provide the needed community treatment and are coordinated with one another. Longitudinal service describes a continuum of care that follows the patient from community setting to hospital visit and back into the community. In this way, the individual's linkages with community services remain intact (Inaugliata, 1982; Witheridge and Dincin, 1985).

Life Skills Training School. First Step, a social learning, community support program located in Evanston, Illinois, is funded by the state's
Department of Mental Health and Developmental Disabilities (Corrigan, Davies-Farmer, and Lome, 1988). It was established as a school for individuals with severe “life problems” to acquire social and coping skills that facilitate community survival. Clinicians were identified as “teachers” and patients were called “students”; the “student” label obviated the anxiety, hostility, and feelings of disempowerment associated with patient status (Katz, 1979). Individuals participated in three 40-minute learning modules daily in a classroom setting, with teachers using social skills training techniques to facilitate acquisition of interpersonal behaviors.

Lazarus divided the realm of human experience into seven domains: Behavior, Affect, Sensation Imagery, Cognition, Interpersonal, and Drugs (health-related behaviors); hence the acronym, BASIC I.D. (Brunell and Young, 1982; Lazarus, 1976). First Step employed Lazarus’s BASIC I.D. to organize its broad curriculum; the modules are summarized in Exhibit 1. Assignment to classes was jointly determined by student and teacher based on current symptom level, prior assessment of skill deficits, and learning modules already accomplished. Progress in the class was assessed at the end of three-month instructional periods on a ten-item checklist specific to each learning module. Students who did not meet criteria repeated the learning area the next quarter it was offered.

Bandura (1969) distinguished between the acquisition of skills—through operant and vicarious conditioning—and the subsequent performance of the behaviors. Newly acquired skills may not be performed in the environment in the absence of opportunities to use the skill or in the absence of reinforcement contingent upon displaying the skills. First Step included a token economy to shape newly acquired skills to criterion levels. To facilitate generalization of these skills, token reinforcement was augmented by a step-level system: As the students’ level of interpersonal functioning improved, their status, responsibilities, and privileges within the milieu increased. Individuals at higher levels participated in the school government or newspaper, with the highest-level students serving as president or editor, respectively.

To facilitate generalization, First Step included in vivo training in which modules were taught in community settings. For example, the “Community Access” class included riding a bus and navigating a shopping mall. Homework assignments were given and a First Step Club was implemented in one of the residences to assist in carrying out the tasks each evening.

First Step participants received case management from a sister agency sponsored by Evanston Hospital. Case managers identified individuals in the state hospital who met entry requirements and facilitated their release into a community residence. In the community, the case managers played an active role in assuring that patients arrived at school daily and in
Exhibit 1. BASIC I.D. Outline of Skills Training Content Areas in the Life Skills Training School

**Behavior**
- *Community Access:* Managing public transportation and locating community services
- *Leisure Training:* Introduction to community recreational activities; fun-time scheduling
- *Money Management:* Skills to manage personal finances
- *Personal Contingency Contracting:* Training in self-monitoring and self-reward to attain personal goals (Kanfer and Gaelick, 1986)
- *Role Playing:* For the more severely disabled patient, exercises that desensitize behavior rehearsal.

**Affect**
- *Relaxation:* A range of relaxation skills varying from autogenic and imaginal exercises to inhibiting anxiety with more active responses (for example, long, vigorous walks).

**Sensation**
- *Body Awareness:* Several exercises to reacquaint the more severely disabled patients with their range of bodily sensations and movements
- *Hallucination Control:* Training in cognitive restructuring and imagery methods to challenge or compartmentalize hallucinations (Rutner and Bugle, 1969).

**Imagery**
- *Imagery Control:* Use of imagery for relaxation and behavior rehearsal (Lazarus, 1984).

**Cognition**
- *Control of Thought Disorder:* Identification of stressful situations provoking thought disorder; plan to avoid decision making within these situations
- *Paying Attention:* Operant and self-monitoring techniques to improve attention (Magaro, Johnson, and Boring, 1986)
- *Rational Thinking:* Techniques to identify and counter irrational thoughts (Perris, 1989)
- *Relapse Prevention:* Identifying high-risk situations and creating a plan to avoid relapse (Marlatt and Gordon, 1983).

**Interpersonal**
- * Assertiveness:* Behaviors that facilitate accomplishing interpersonal, instrumental goals
- *Conversational Skills:* Behaviors including eye contact, body language, and appropriate discussion topics
- *Family Interactions:* Skills to help separation from the family; negotiating skills for family disagreements (Falloon, Boyd, and McGill, 1994)
- *Pre-Work Skills:* Time scheduling; skills to facilitate working with others under supervision
- *Problem Solving:* Problem-identification and solution-generating skills for interpersonal dilemmas (Wallace, 1982)
- *Sexuality and Dating:* How to get a date, birth control, and pregnancy (Lukoff and others, 1986).

**Drugs**
- *Health:* Nutrition and exercise strategies: self-monitoring of physical health
- *Hygiene:* Personal grooming and clothes maintenance

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implementing First Step behavior programs in the patients' residence. Moreover, case managers coordinated treatment with other agencies, advocating for their patients when necessary to make certain that psychiatric, medical, and residential care was adhering to standards.

A two-year, quasi-experimental analysis of the First Step Program was completed (Corrigan, Davies-Farmer, Lightstone, and Stolley, in press). Subjects for this study had at least a three-year history of schizophrenia, multiple hospitalizations, and one to three failures in previous outpatient programs. After eighteen months of treatment, First Step subjects significantly decreased their rate of hospitalization by 82.5 percent. Translated into cost-benefit ratios, the community program was 57.5 percent less expensive than year-round inpatient care and 43.2 percent less expensive than residing in a community residence and receiving only case management. In addition to being measured for rehospitalization rates, subjects in the treatment group were assessed for changes in the acquisition, performance, and generalization of skills (Corrigan, Davies-Farmer, Lightstone, and Stolley, in press). Results showed a steady and significant increase in the acquisition and performance of trained skills. There was evidence that the treatment resulted in generalization of skills to other settings and a broader range of responses, although this trend did not reach statistical significance. The success of the First Step Program replicated earlier demonstrations of the efficacy of social learning methods in community mental health centers (Liberman and Bryan, 1977; Liberman and others, 1982; Liberman and Mueser, 1989).

Summary

Several behavioral rehabilitation strategies have been empirically validated in the treatment of schizophrenia and are now the psychosocial treatments of choice for chronic mental disorders. The stress-vulnerability model and an empirically based decision tree offer clinicians' guidance in prescribing strategies that are particularly relevant for each patient. Hence, behavioral family therapy may be indicated for patients who experience disease exacerbation that results from stressful family interactions. Patients with insufficient social and coping skills may benefit from skills training. Supported employment and job-finding clubs may be indicated for patients with deficits in work skills. The form and programmatic matrix of these strategies differ, depending upon their locus in inpatient and outpatient settings.

References


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