

Identifying and Addressing Cognitive Barriers to Rehabilitation Readiness

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Introduction by the column editors:

People with chronic psychotic disorders suffer from deficits across a large number of neurocognitive domains, including problems of distractibility and memory problems, lack of vigilance, attentional deficits, and limitations in planning and decision making. Although newer atypical antipsychotic medications may have greater efficacy than conventional neuroleptics for improving cognitive functioning (1), it is unlikely that these agents will completely eliminate the panoply of deficits associated with serious mental illness.

Complementary strategies based on behavioral approaches for cognitive rehabilitation have shown promise in a growing body of experiments (2). Underlying these efforts is the belief that remediating abnormal cognitive functions will increase patients' ability to benefit from other therapeutic approaches and will improve patients' social functioning and functioning in other areas.

In choosing from among available cognitive rehabilitation procedures, the clinician should select those that have been empirically validated, that have demonstrated generalizability to everyday functioning, and that are appropriate for the clinical population. For example, some readily available interventions for cogni-

tive rehabilitation have not shown evidence of generalizability (3).

In this month's Rehab Rounds, Steven Silverstein and his colleagues describe their work with treatment-refractory patients whose cognitive functioning is profoundly impaired. For such persons, individually tailored interventions based on social learning are the most effective means of cognitive remediation, if we define cognitive remediation as any intervention that yields improved cognitive and neurobehavioral functioning (4-7). These treatments reinforce incremental increases in both length of time spent on a task (that is, attention span) and accuracy of performance.

The accuracy of performance is increased by using "shaping" procedures, which help the patient work gradually toward a specified goal by reinforcing successive steps that proceed in the desired direction and by not reinforcing responses that do not. Shaping is particularly useful for treatment-refractory patients because the therapist can reward even the smallest approximation of the desired behavior.

Individuals with schizophrenia may possess cognitive impairments that limit their ability to learn and acquire new skills in psychiatric rehabilitation interventions (8). The University Services Psychiatric Rehabilitation Program of the Rochester Psychiatric Center has identified and addressed these deficits with the aim of bringing even the most severely impaired individuals into the fold of psychiatric rehabilitation. The program setting is a 30-bed long-term inpatient unit that

is jointly administered by the Rochester Psychiatric Center and the University of Rochester Medical Center. Program participants are generally treatment refractory and have demonstrated a longstanding inability to live outside of a hospital setting.

Other than pharmacotherapy, the primary treatment modality on the unit is psychiatric rehabilitation. Social and independent living skills modules, developed at the UCLA Clinical Research Center for Schizophrenia and Psychiatric Rehabilitation (9,10), form the bedrock of the rehabilitation program. The modules are designed to compensate for cognitive impairments by using a highly structured presentation format, frequent repetition of material, auditory and visual presentation of information, and frequent verbal reinforcement for attention and participation. Despite these compensatory techniques, however, for many participants profound cognitive deficits limit their ability to make meaningful gains in these training curricula.

To determine readiness to participate in skills training, all program participants complete a battery of cognitive tests focused on functions believed to mediate skill acquisition such as reaction time, sustained attention, verbal memory, intelligence, and concept formation. We have used this cognitive battery to determine which deficits predict poor skill acquisition in module-based training.

Most of our research on cognitive barriers has used a module on basic conversation skills. The aim of this module is to teach patients how to initiate and maintain friendly conversations with acquaintances and strangers

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and thereby to decrease patients' social isolation. The module is divided into five skill areas—verbal and nonverbal communication behaviors, starting a friendly conversation, keeping a conversation going, ending a friendly conversation pleasantly, and putting it all together. Skill acquisition is determined by an oral examination that assesses patients' knowledge of the skills and by a structured role play that tests the ability to demonstrate the skills.

In an initial evaluation of 21 persons with schizophrenia, sustained attention significantly predicted skill acquisition (11). In a more recent evaluation, performance on the Rey Auditory Verbal Learning Test (12) combined with the number of omission errors on a simple reaction-time task (the number of auditory signals to which the person should have responded but did not) accounted for 42 percent of the variance in amount of learning. The omission error index was the best overall predictor. These data indicate that attentiveness and verbal memory are critical to the skills training enterprise. Thus participants with profound impairments in attention and memory appear to be limited in their ability to benefit from social skills training.

We have approached this challenge to rehabilitation in several ways. One method has been to modify the treatment environment. Ward structure was increased through the institution of a token economy. Group attendance and participation are reinforced immediately after sessions with verbal praise and tokens that are redeemable for consumables. Participation goals are operationalized and individualized for each person, and incremental improvements in performance are rewarded with tokens. In addition, group attendance and appropriate behavior during groups are included in patients' daily ratings, which determine their level of privileges. These changes have led to a noticeable decline in inappropriate and disruptive behavior and to improved cognitive functioning for some of the lower-functioning program participants. The following case example illustrates the use of a token economy to encourage group attendance and appropriate group participation.

Case 1

Mr. B is a 42-year-old single Caucasian male with chronic, disorganized schizophrenia who was hospitalized continuously for the past 12 years. Before the initiation of the token economy system, he rarely attended groups, and when he did, he was disruptive and incoherent and often left the group after about ten minutes.

After the initiation of the token economy in which token distribution was linked to attendance and participation, Mr. B's attendance improved from an average of 32 percent of sessions in the five months before initiation of the token economy to 100 per-

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cent of sessions in the month after it began. Moreover, his disruptive behavior rating (7) dropped from 2.83 to 1.15 (on a scale ranging from 1, rarely, to 3, frequently). In addition, his aloia score, which included measures of both poverty of speech and incoherence (13), dropped from 1.93 to .20 (on a scale from 0, normal, to 2, mildly impaired). For Mr. B, the initiation of procedures that reinforced group attendance and meaningful participation led to dramatic changes in both behavior and verbal functioning.

Using shaping procedures

In skills training groups. For lower-functioning residents who had previously demonstrated a poor response to groups, smaller groups of four or five members were established to

provide a less distracting environment and opportunities for more consistent involvement in the learning process. An important feature of such groups is an attention check at regular intervals, such as every ten minutes, or longer for higher-functioning patients. At each interval, group members are given feedback about their level of attention and progress toward their individualized participation goals during the most recent segment of the group. For individuals who meet criteria, a check is entered on a chart next to their name, and they are given a token. The combination of small group size, the use of individualized participation criteria that change as individuals show small performance improvements, and frequent checking of performance against criteria has led to increases in attention span and participation in skills training groups.

To increase attention span. For the most cognitively impaired individuals who are unable to benefit from modified skills training formats, groups based entirely on the goal of shaping attention span are an effective first step in psychiatric rehabilitation (5–7). These treatments involve the performance of relatively simple tasks. They reinforce individuals for incremental increases in attention span and performance accuracy using traditional shaping procedures, including immediate administration of reinforcers after a goal, such as working for 12 minutes at 80 percent accuracy, is met.

Case 2

Mr. D is a 39-year-old single Caucasian male with a diagnosis of chronic, disorganized schizophrenia. His intellectual functioning is within the range that represents borderline mental retardation. Mr. D had numerous psychiatric hospitalizations beginning at age 19, and his current hospitalization exceeds nine years. He was included in a four-member shaping group due to his extreme distractibility, his tendency to get up repeatedly and attempt to leave the room during groups, and his tendency to frequently interrupt groups and perseverate on idiosyncratic and irrelevant material.

Before Mr. D joined the shaping

group, his maximum attention span, or period of continuous work performance, was 14 minutes. However, after 28 sessions of shaping over a period of seven weeks, he was able to work without stopping for 50 minutes. This change was maintained for another 24 sessions, until shaping classes ended. After several weeks of shaping, art therapy staff reported that Mr. D was, for the first time, sitting through entire art therapy sessions without getting up. He is now in a traditional skills training group, where he has sat through the entire group for each session (6).

Case 3

Mr. J is a 36-year-old single Caucasian male with a diagnosis of chronic, undifferentiated schizophrenia. He was first hospitalized at age 18, and he has had a total of ten hospitalizations. He has spent the majority of his adult life in psychiatric institutions, and his current admission has lasted more than 13 years. Mr. J was included in shaping classes because of his poor attention span, his inability to answer questions in groups, and his tendency to fall asleep during group sessions.

Mr. J's baseline attention span before beginning shaping classes was under ten minutes. After 26 sessions in six weeks, he was able to work continuously for 50 minutes. When Mr. J reached a 30-minute attention span, he began the basic conversation skills module, in which he demonstrated significant acquisition of new skills and knowledge. He maintained a 40- to 50-minute attention span for his remaining 26 shaping sessions. Mr. J was discharged three months after completing shaping classes (6).

Conclusions

Many individuals with chronic psychosis are characterized by cognitive deficits that limit the rate of skill acquisition in psychiatric rehabilitation. We have found our cognitive screening battery to be a practical method to assess the presence of these deficits. The recognition that severely cognitively impaired persons in long-term inpatient settings may be unable to benefit from conventional treatments behooves practitioners to find ways to

improve patients' cognitive functioning. In our experience, significant advances toward this goal have resulted from instituting a token economy and shaping procedures that focus on reinforcing attentive behavior.

Afterword by the column editors:

This effective program in Rochester illustrates the importance of specialized behavioral or psychosocial interventions—in addition to the benefits possible from atypical antipsychotic drugs—in services for persons with treatment-refractory schizophrenia. The token economy or social learning program is a comprehensive, 24-hour-a-day special education environment in which individuals who have neurocognitive deficits can be motivated to improve their attentional capacities and daily living skills. Token economy systems provide explicit procedures for participants' earning, spending, and losing tokens, coins, chips, cards, or points that are vested with reward value because they can be exchanged for desired goods, services, and activities. The conditions for earning and spending are the contingencies of reinforcement that, as in the Rochester program, can be flexibly applied for shaping small increments of improvements in instrumental, self-care, social, and recreational behaviors.

Structured and highly specified inpatient and day hospital programs that have used token economies have been shown to yield shorter hospital stays, longer community tenure, and substantial improvements in symptoms, social functioning, goal attainment, and self-care skills among persons with otherwise treatment-refractory illnesses (14–16). Moreover, the effectiveness of social learning programs appears to be additive and supplementary to the benefits from atypical antipsychotic drugs (17). ♦

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