

## **Neuropsychological Rehabilitation After Brain Injury: Scientific and Professional Issues<sup>1</sup>**

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*Neuropsychological rehabilitation after acquired brain injury is an important contribution to our health-care system. Despite a growing database which supports its clinical utility, the insurance coverage for this form of care is now being threatened. This paper addresses some of the professional and scientific issues that psychologists need to face in order to continue to provide these services.*

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**KEY WORDS:** neuropsychological rehabilitation; scientific issues; professional issues.

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### **INTRODUCTION**

In February 1980, we began a neuropsychologically oriented rehabilitation program for postacute traumatic brain injury (TBI) patients at Presbyterian Hospital in Oklahoma City. At that time, the oil industry in Oklahoma and Texas was doing quite well and considerable financial support was available from hospital administrators to do what I felt was efficacious for these patients and to document via clinical research projects the outcome of such efforts (Prigatano *et al.*, 1984). Insurance coverage for this form of care varied, but as we attempted to define whom we could help and whom we could not, insurance carriers began to fund what was then a 6-month program of care. The program was designed to admit a small group of patients (between five and eight) at a single time and work with them intensively for 6 to 8 hr a day, 4 days a week. Patients were

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discharged at the same time and we could directly measure whom we had helped and whom we had not.

However, times have changed. In this paper, I review some of those changes and the scientific and professional issues that now confront us. These issues, if not dealt with effectively, threaten the delivery of services that are badly needed by some brain dysfunctional patients. If psychology, as a profession and scientific discipline, helps deal with these problems, we will clearly add something positive to the health care of our nation.

### WHY DO WE NEED NEUROPSYCHOLOGICAL REHABILITATION?

A substantial body of knowledge documents three important facts:

1. Damage to the cerebral hemispheres (as well as the cerebellum) leads to permanent changes in neuropsychological functioning.
2. While certain functions may improve with time, there is always a permanent residual impairment and those residual impairments have definite psychosocial consequences.
3. Without specialty rehabilitation programs aimed at dealing with these disturbances and their psychosocial impact, the adaptation of patients and families may well deteriorate with time.

A sample of empirical findings is reviewed to document these points. One outcome paper from the Traumatic Coma Data Bank (TCDB) project, which was funded by the National Institute of Neurological Disorders and Stroke, investigated neuropsychological outcome one year after severe TBI. Severe TBI was defined as an admitting Glasgow Coma Scale (GCS) score between 3 and 8. More than two-thirds of these patients were unable to complete even a neurobehavioral assessment at a 1-year follow-up due to significant neuropsychological impairments. Of the patients formally studied, significant disturbances in memory and speed of information processing were documented (Levin *et al.*, 1990).

In the United Kingdom (UK), Brooks, McKinlay, Symington, and Campsie (1987) followed 98 severely head-injured patients over a 7-year period after injury. While 86% of these individuals were employed before their injury, only 29% were employed during the follow-up period. Disturbances in memory and speed of information processing clearly separated "workers" from "nonworkers." In addition, Brooks *et al.* (1987) showed that behavioral and emotional disorders, which are common with these types of injuries, also separate those who were employed from those who were unemployed.

Although the severity of some neuropsychological disturbances may plateau with time, the psychosocial consequences do not. Rutter and colleagues (Rutter, 1983) showed that while measures sensitive to speed of information processing may improve during the first 1 to 2 years after injury in TBI children, there is an exponential increase in new psychiatric or behavioral disorders during this time. The more recent work of Kenneth Jaffe and J'May Rivara documents this same point (see Rivara, 1994; Rivara *et al.*, 1994). They have shown that not only do the children progressively fall behind academically compared to their age-matched peers, but also family members show global deterioration in their ability to cope with a variety of stressors with the passage of time. Kreutzer, Marwitz, and Kepler (1992), in a review paper, have documented the long-term negative impact that TBI has on family members. Without neuropsychologically oriented rehabilitation, this is the natural course of significant bilateral cerebral dysfunction in adults and children.

### EFFICACY OF NEUROPSYCHOLOGICAL REHABILITATION: PROCESS AND OUTCOME DATA

Given the inevitable residual neuropsychological disturbances and the declining psychosocial adjustment of these patients, what is the evidence that neuropsychologically oriented rehabilitation makes a substantial difference? A few studies that appeared between 1984 and 1994 attempted to answer this question. Prigatano *et al.* (1984) showed that 50% of TBI patients involved in a neuropsychologically oriented rehabilitation program were able to return to full-time gainful employment after their rehabilitation. These patients were postacute and had already failed to establish adequate psychosocial adjustment on their own or by using traditional rehabilitation. In that study, however, the sobering observation that 36% of the control patients were able to work emphasized that modifications in the existing neuropsychological rehabilitation program had to be made. The establishment of a work trial as a part of rehabilitation as opposed to something after rehabilitation was instituted. Work trials seemed to increase the number of individuals who were able to be productive after brain injury even though the percentage that was actually able to be gainfully employed did not change (Prigatano *et al.*, 1994).

Ben-Yishay *et al.* (1985) also reported that 50% of patients undergoing their rehabilitation program were able to return to gainful employment. Unfortunately, no control group was utilized. In an extended study by Prigatano and others (1986), similar percentage figures for returning to work were reported for TBI patients and the neuropsychological and behavioral

problems that separated those that returned to work compared to those who did not were documented. The problem of impaired self-awareness was clearly identified as a major deterrent for returning to a productive lifestyle.

Ben-Yishay and Prigatano (1990) summarized some of the major ingredients in cognitive rehabilitation and work done by Ben-Yishay and colleagues on predictors of return to a productive lifestyle. Although severity of coma and neuropsychological deficits accounted for a portion of the variance (i.e., 7% and 12%, respectively), the most powerful predictors were the patients' capacities to learn to control their emotional reactions, to interact successfully with others during small group activities, and to show acceptance and awareness of their disabilities (i.e., 46% of the variance). The ability, therefore, to integrate socially with others during rehabilitation seems to be a powerful predictor of outcome.

The follow-up work by Rattok *et al.* (1992) further clarified these earlier observations. Patients who had received rehabilitation that emphasized small-group interaction and the ability to adjust in small groups tended to show not only greater self-control but perhaps increased awareness of their residual disabilities. It is difficult to measure and therefore to illustrate that this particular variable is a major predictor of psychosocial outcome. However, it has repeatedly been my impression that individuals with a realistic sense of how they have been affected ultimately make much better adjustments. Knowledge about the self does not always lead to depression as some have implied (Godfrey, Partridge, Knight, & Bishara, 1993). It can lead to more effective problem solving.

In Europe, Christensen, Pinner, Moller Pederson, Teasdale, and Trexler (1992) further documented that the methods developed by Ben-Yishay *et al.* and Prigatano *et al.* were helpful in improving the psychosocial outcome of a variety of brain dysfunctional patients.

Finally, a recent study that utilized controls (Prigatano *et al.*, 1994) showed not only that neuropsychologically oriented rehabilitation was effective in returning approximately 50% of patients to gainful employment, but that an additional 25% could be helped to obtain and maintain meaningful voluntary work. This is no small contribution for individuals with devastating brain injuries that preclude them from becoming productive. Being able to be productive is a major symbol in our society for meaning, and without meaning (with or without brain injury) individuals do not do well in life (see Prigatano, 1989a; Prigatano, 1991). The potential usefulness of neuropsychological rehabilitation has now been recognized by others (Bergquist *et al.*, 1994).

Against this growing body of information concerning the efficacy of neuropsychological rehabilitation, there has been a major change in how

health care is reimbursed in the United States. This financial tidal wave threatens to destroy existing programs as well as to preclude the development of other such programs. It is hard enough to develop a rehabilitation staff to deliver this type of service (see Prigatano *et al.*, 1986; Prigatano, 1989b), let alone find funds to pay for staff who have developed their professional skills to perform this type of work adequately. In the presence of this economic wave that threatens to destroy what we have accomplished in the last 10 to 15 years, it becomes extremely important for psychologists to face key scientific and professional issues that may help stem the tide so that work of this type can continue.

### PROFESSIONAL AND SCIENTIFIC ISSUES

From my perspective, there are four major scientific issues that we must face if the field of neuropsychological rehabilitation is to flourish in the future. First, well-controlled studies on the efficacy of neuropsychological rehabilitation (which includes cognitive remediation or rehabilitation) must be performed (Ben-Yishay & Diller, 1993). One cannot make the claim that it is impossible to provide control groups. While a purely randomized group design may be difficult to approach in rehabilitation, the closer we come to it the more believable our findings will be.

Second, a scientific understanding of the mechanisms of recovery of higher cerebral deficits is crucial to establishing a strong link among neurosciences, cognitive neurosciences, and neuropsychological rehabilitation. As others have noted (Ben-Yishay & Diller, 1993), this link must develop for cognitive rehabilitation to have a sound theoretical and empirical basis. Some initial efforts have begun in this regard (Prigatano, 1995). Psychologists, as scientists, are in a unique position to add to this body of knowledge.

Third, scientific studies on the long-term outcome of individuals who receive neuropsychological rehabilitation versus those who do not are crucial. If it can be shown (and I believe that it can) that moderate to severely injured TBI patients show a progressive decline in employment when their higher cerebral deficits and emotional reactions to them are not fully addressed in rehabilitation, then a larger percentage of individuals receiving such care should remain gainfully employed and productive throughout their life. Work by Thomsen (1984) suggests that less than 10% of severe TBI patients will be working 10 to 15 years after injury. This finding is in contrast to the 30% reported by others who studied patients 2 to 7 years after injury (Brooks *et al.*, 1987; Prigatano, Klonoff, & Bailey, 1987). The question is, How about patients who receive neuropsychological rehabili-

tation? I would predict that about 40% of these individuals will maintain gainful employment, compared to the 10% who do not receive such rehabilitation services.

Fourth, studies are needed to assess adequately the long-term economic benefits of such rehabilitation. The economic benefits should not be limited to the amount of services that are provided for individuals, wages that are recaptured, etc. It should also include the cost associated with family members of brain-dysfunctional patients seeking mental health services and being unable to work because of an injured loved one. Some initial work has begun in this regard (Teasdale, 1995).

In addition to these scientific issues, there are three professional issues that have to be dealt with. First, neuropsychologists involved in rehabilitation must find some way to communicate effectively with third-party payers about how to spend rehabilitation dollars wisely. Putting the majority of financial support into early medical and rehabilitative care is unwise. These patients (and their families) have life-long needs. Unless the rehabilitation dollar can be spread over many years, these patients will not be served adequately. It is my belief that monies should be set aside, particularly for working with young adult patients approximately 1 to 2 years after their injury. At that point, aggressive efforts at neuropsychological rehabilitation may be especially helpful in avoiding long-term costs. Also, funds should be set aside to work with brain-dysfunctional children at key developmental stages when it may be crucial to work with them to facilitate overall level of recovery and adaptation.

Second, psychologists involved in rehabilitation should take seriously their responsibility not to waste rehabilitation dollars. It is extremely important that psychologists working with brain-dysfunctional patients have well-developed diagnostic and therapeutic skills. The need to know when to begin treatment, when to stop it, and what kind of treatment is necessary is quite important.

Often, patients are given multiple neuropsychological tests and detailed neuropsychological reports are written which have very little practical information. Little is communicated regarding "what is wrong" with the patient and how that information can be used effectively by rehabilitation staff and family members.

Patients may also receive inappropriate rehabilitation. Two case examples come to mind. The first is a man with bilateral frontal lobe damage. He received rehabilitation services that included placing him in a job setting using a supported employment model. His degree of frontal lobe pathology was so extensive that his behavior was constantly socially inappropriate. He would make inappropriate comments or gestures. The degree of brain injury was such that it was highly unlikely that he could work in any kind of

setting where he interacted with people. The rehabilitation team, of which psychologists were members, fostered a treatment program aimed at work reentry even though it was unrealistic for this patient.

The second example is a young woman who suffered a mild head injury that resulted in a clear posttraumatic stress disorder. She demonstrated mild memory impairment, but was very emotionally labile, angry, and phobic over driving a car. She had continued sleep disturbances with an increase in headaches as she attempted to do any cognitive task. She behaved as if she were severely impaired when all objective evidence suggested mild neuropsychological impairments.

She was involved in a neurological rehabilitation program that was aimed primarily at helping patients with moderate to severe brain injury. Her litigation continued to fuel the notion that she had suffered a moderate to serious brain injury that was disabling to her, when, in fact, this had not occurred. A brief consultation revealed that many of her somatic complaints, which included headache, appeared to be a reaction to her being less efficient in performing cognitive tasks. In the past, she had put a great deal of energy into coping with stressful life situations by using her intellect and delving into her studies. When emotionally distressed, she would turn to academic pursuits for relief. The slightest change in her intellectual capacities, therefore, was overwhelming.

After a lengthy and expensive course of rehabilitation, she was told by a neuropsychologist that she could not continue to be worked with in psychotherapy until her headaches were medically under control. The patient's headaches, which had been medically treated, appeared to be a reaction precisely to her failure in coping. From my perspective, if the patient was worked with effectively in psychotherapy and cognitive remediation, this issue would be discussed and her headaches would be a part of the focus of her therapeutic work. Unfortunately, she was involved in a rehabilitation program that ultimately turned out to be impractical and expensive.

Clearly, dollars are being spent unwisely because rehabilitation therapists and psychologists may lack the proper skills to understand adequately and to treat the problems they confront. In this regard, it is extremely important that psychologists and rehabilitation specialists of all disciplines demonstrate that what they prescribe by way of treatment is in fact useful and helpful to the patient. Otherwise, third-party payers will continue to be skeptical of the benefit of neurorehabilitation. Equally powerful, the people who make decisions to reimburse for psychological services will do so based purely on financial considerations as opposed to informed health-care decisions.

The third professional issue that faces neuropsychologists is to apply the American Psychological Association (APA) code of ethics when dealing with the marketplace. The APA has produced one of the most lengthy set of guidelines governing the ethical behavior of people who provide health-care services. Many other professions do not have such extensive guidelines. Our organization is committed to ethical behavior; therefore, it is extremely important that we price our services fairly and not base it totally on what others will pay. It is important to keep the profit motive in check when dealing with the health-care needs of other individuals. This caveat applies to us as well as to managed care systems. I would quickly add, however, that we also should not give away valuable services simply because managed care programs will pay less for them. In setting fees, clinical neuropsychologists as well as psychologists as a whole should consider not only what is equitable by way of return for their time, given their training and experience, but the demonstrated positive impact their interventions have on a patient and family. We desperately need solid leadership and research that documents the value of various forms of psychological services within the national health-care system.

## CONCLUSIONS

This presentation has highlighted one example of clinical neuropsychologists' contributions to the health care of brain-dysfunctional patients. Clearly, we have services to provide that are both useful and valuable. There is a strong need to clarify and take seriously certain scientific and professional issues surrounding this type of work. If we do so, we can ensure that neuropsychological rehabilitation for brain-dysfunctional patients will continue to be a viable activity, both professionally and scientifically.

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