

Cognitive Retraining and Functional Implementation
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There is a wide range of commercial products available such as texts, computer programs, and workbooks to assist the client in relearning cognitive skills. Once learned, it is necessary that the client repeat the skills when performing tasks in his or her daily life. There are several strategies to help the client organize daily life activities, once he or she recognizes that there is indeed a need for such organization.

Once the assessment process has been completed and the cognitive strengths and limitations identified, the rehabilitation plan should be twofold: to build a base of cognitive skills through remediation and identification of compensatory techniques; and to provide the opportunity for frequent use of the newly learned skills through functional applications in day-to-day living (functional implementation).

Building a Cognitive Base

Cognitive retraining can take many forms depending on the needs and responses of the head-injured client, the expertise of the primary service providers, and the materials and equipment selected for use. The client's needs should already have been carefully identified and defined through the evaluation process. Those professionals providing the cognitive retraining may include speech/language pathologists, occupational therapists, neuropsychologists, psychoeducation specialists, and specially trained "cognitive therapists," who should always work under the supervision of a qualified professional.

Publications

The materials and equipment presently used for cognitive retraining include some commercially developed products, as well as materials developed individually by clinicians who work with this population on a daily basis. Therefore, in examining the therapeutic process used by a cognitive retraining program it is more important to assess the process being used to develop cognitive skills than it is to examine the materials themselves.

However, commonly used materials include the following:

Cognitive Reorganization: A Stimulus Handbook
Sharon M. Halloran and Elizabeth J. Bressler
C.C. Publications, Inc.
P.O. Box 23699
Tigard, Oregon 97223

This workbook contains more than 4,000 stimuli organized into seven areas of concentration: orientation and memory, simple relationships and associations, simple problem solving, abstract reasoning, functional problem solving, independent information management, and functional activities of daily living. Structured tasks are presented in an ascending hierarchy of difficulty in four parameters: amount of stimulation, power of stimulation, complexity of stimulation, and level of abstraction.

Midwest Publications Materials
Available from Midwest Publications Co. Inc.
P.O. Box 448

Pacific Grove, CA 93950
Of particular interest:
Inductive Thinking Skills by Anita Harnadek
Cause and Effect
Relevant Information
Reasoning by Analogy
Open-Ended Problems
Basic Thinking Skills by Anita Harnadek
Following Directions-B
Verbal Sequences by Howard and Sandra Black
Verbal Classifications by Howard and Sandra Black
Mind Benders by Anita Harnadek

Therapy Guide for the Adult with Language and Speech Disorders
Kathryn Kilpatrick
Visiting Nurse Service of Summit County
1200 McArthur Drive
Akron, OH 44320

The second volume, *Advanced Stimulus Materials* is inappropriate for the head injured population than the simpler first volume. While designed with the adult aphasic in mind, this work contains stimulus materials suitable for use in a cognitive retraining program. It contains sections addressing comprehension, word retrieval, sentence formulation, general knowledge, thought organization, definitions, number skills, and daily needs.

Workbook for Adult Language and Cognition
Kathryn J. Tomlin
LinguiSystems, Inc.
716 17th Street
Moline. IL 61265

Workbook 1: Attention. Concentration, and Memory for General Information

The attention and concentration section of the first workbook uses mathematics problems and various word puzzles designed so that the patient can complete the tasks with minimal challenges to his cognitive abilities. Rote memory skills are tapped through general information questions, which may be responded to with words or elaborate answers depending on the individual's linguistic and cognitive abilities.

Workbook 2: Visual and Auditory Memory and Sequential Thought

This workbook concentrates on visual and auditory memory, numbers, words, and sentences in varying stimulus lengths. The exercises are recommended for use in conjunction with more functional memory tasks and may be helpful in teaching strategies as "chunking" and visual imagery. The second part focuses on organization and retraining of cognitive skills through sequential thought. Exercises range from sentence completion and scrambled words and sentences to sequencing the steps in various activities.

Workbook 3: Reasoning

These materials are arranged in hierarchical steps to allow progression from concrete to more abstract reasoning skills. They are designed to facilitate the patient's ability to organize information, solve problems, reason, and develop insights. The activities are quite varied and could be used to develop similar stimulus materials that are individualized based on the patient's interests and skills.

Workbook for Aphasia: Exercises for the Redevelopment of Higher Level Language Functioning
Susan Howell Brubaker
Wayne State University Press
Detroit, Michigan 48202

This workbook was prepared for use by clinicians working

with patients who are aphasic. It provides a range of materials focusing on word usage, development of syntax, language sequencing, written directives, use of factual information, use of concrete reasoning, and personal expression.

Workbook for Reasoning Skills

Susan Howell Brubaker

Wayne State University Press Detroit, Michigan 48202

This workbook was designed for use with individuals with closed head injuries who have mild to moderate cognitive deficits. The six target areas emphasize real life situations: drawing conclusions, problem solving, following directions, visual/logical sequencing, humor, and numbers/symbols. The materials can be adapted as needed and are useful as independent assignments or as a part of a therapy regimen.

Computer Software

Computer programs are used frequently as a supplement to cognitive rehabilitation provided directly by the clinician. The use of computers has the advantage of providing immediate and consistent feedback through a medium which many people find to be interesting and a welcome change from the traditional therapist client interaction. An example of computer software, which I used effectively with the traumatically head-injured patient, is the *Cognitive Rehabilitation Series* by Jacqueline Smith, available from Hartley Courseware, Inc., 123 Bridge, Box 419, Dimondale, Michigan 48821. This series consists of five separate program discs the first four of which deal with: 1) Categorization, 2) Sequencing, 3) Association, and 4) Memory. The fifth disc is the Authoring Program, which allows the therapist to develop materials designed to meet specific needs of the user. The lessons are easy to use and modify, and individual and group records can be maintained.

Basic skill building is also important in building a cognitive base. It may be necessary for the patient to relearn such skills as reading and mathematics in order to accomplish daily activities. If a reading or math impairment is identified in the evaluation process, it should certainly receive therapeutic attention. However, reading, math, and other academic skills should be addressed as they relate to the day-to-day functioning of

the individual. For example, if the patient can read sufficiently to complete a job application, it may not be necessary to spend clinical time focusing on reading and comprehending lengthy passages. If he or she can use a calculator as a bypass technique for balancing a checkbook, it may not be necessary to relearn the fine points of borrowing and carrying.

Targeted practice using exercises specifically designed to develop or restore cognitive functions will almost always need to be supplemented by compensatory techniques or strategies. Szekeres, et al. (1983) define a compensatory strategy as "deliberate, self-initiated application of a procedure in order to accomplish a desired goal otherwise difficult to accomplish because of impaired functioning."

Functional Implementation

Almost every task, which is performed throughout the day can be viewed as an opportunity to implement newly learned cognitive skills or compensatory techniques. The day-to-day activities performed by the head-injured person provide professionals with significant information about the cognitive functioning of that person and also provide the ideal setting in which to demonstrate new ways to deal more effectively with the environment. For the more severely impaired, even the morning hygiene routine may be more than they can manage cognitively.

Activities which are automatic for most of us often require many cognitive functions operating simultaneously to assure, for example, that we are ready to leave the house by a certain time in the morning. We must be oriented to time and know approximately how long it takes for each task. We must recall a wide range of information, such as where we put our purse or wallet the night before. We must be oriented to space in order to find our way to the bathroom. We must make a judgment about the weather by recalling pre-existing information, or by looking outdoors, or by listening to the weather report. And once we know the weather information we must then decide what to wear based on our past associations. We must recall what we wore the day before so that we do not put on the same soiled clothes again. All of these cognitive processes and more have occurred and we haven't even had breakfast yet! Many head-injured people are so severely impaired that they cannot be sure whether they have just risen or are ready to go to

bed. Others, less severely impaired, are still easily confused and distracted, requiring some sort of system within which to operate.

Szekeres. et al. (1983) suggest three phases of intervention when teaching compensatory strategies to head injured patients: general strategic thinking; teaching the strategy; and generalization and maintenance. It is believed that patients will not be responsive to learning new cognitive strategies unless they recognize the need for such a strategy. Therefore, self-insight is as important as the realization that strategies are useful in helping people to function more efficiently. Strategies can be taught by modeling after the therapist, another patient, or videotape self-discovery (where the patient discovers effective techniques himself) or direct instruction, which may need to be repeated many times. Transferring the compensatory strategy to the real world and everyday life presents the real challenge to both the patient and the therapist.

Strategies to Enhance Cognitive Functioning

Once the client recognizes the need for organizational strategies to ensure that he or she is able to manage the challenges of day-to-day living, a number of such strategies may be learned. These may include learning ways to efficiently organize time and materials and may involve keeping daily journals as well as using sequential instruction lists for such activities as shopping or cooking.

Organization of Materials

If a brain-injured person has difficulty accomplishing even the simplest of tasks, it may be because there is insufficient structure to the environment. Therefore, it is very helpful to assist him or her in organizing the immediate environment. "'A place for everything and everything in its place" is a good rule to follow. In trying to provide this type of structure, it is best if the patient makes the final decision as to where personal items should be placed, how the room is arranged, arrangement of the items on the desk, etc. It is often helpful to label drawers initially until the room organization is learned; some individuals may need the labels on a permanent basis. Whenever a change is made in the living setting the patient

may need to go through the organization process again. If he or she will be cooking and making regular use of the kitchen, it too will need to be structured, particularly if there are physical limitations to be accommodated as well.

Organization of Time

Orientation to the passage of time and its meaning can be helpful in enhancing the functional abilities of the patient. While many view the adherence to a rather rigid schedule as confining for brain-injured persons it actually allows them to perform adequately in the day-to-day routine. Therefore, the use of a daily schedule is encouraged, where initially any activities can be scheduled in written form, and the relationship between the clock or watch and the schedule can be taught. For some, it is helpful to color code the various activities and relate the color on the schedule to further instructions, which may be contained in an accompanying notebook. For example, all activities relating to cooking are marked in green. When the green mark appears, the patient knows to turn to the green section of the notebook which may maintain meal plans, a shopping list, recipes, and/or other instructions. In the initial phases of using a schedule and notebook it may be necessary to assist the patient in marking off each hour or activity so he or she can learn to move on to the next activity at the specified time.

Journals or Memory Books

Memory problems being so prevalent in this population, the use a "memory book" is a frequently used technique. Writing information down may help the client to retain it. If the information is not retained, there still remains the written record. Initially, it may be necessary to record every activity immediately upon its completion. It may also be necessary for the clinician to help the patient recall what the activity was and to form the words to write in the notebook. It is also helpful for the patient to record feelings and opinions when they occur so that he or she can refer back to them. For some, it may be sufficient to make entries in the journal once twice a day.

Sequential Instructions

It is often necessary to break down an activity into steps, which can be followed one at a time. Once activities

important to the patient are identified, a notebook can be developed containing the step-by-step instructions and even forms to be completed. For example, a brain-injured person may be able to shop independently if necessary information is available. Instructions in the "Shopping" section of his or her notebook might include:

- (1) Check to be sure you have completed the shopping list for this week (available in another section of the notebook).
- (2) Do you have enough money for the cab and the groceries?
- (3) Call a cab (phone number).
- (4) Go to the National grocery store.
- (5) Following your map of the store, select the items on your list.
- (6) Do not buy anything that is not on your list.
- (7) Ask at the manager's office for Mrs. Smith to help you check out (Mrs. Smith knows the patient and will screen to make sure the proper items are purchased and will help the patient count out the correct money).
- (8) Call a cab (phone number).
- (9) Return to your apartment and put the groceries away.
- (10) Be sure to follow the instructions in the "Food Preparation and Care" section of your notebook.

This technique is particularly useful in developing a cookbook that is personalized to the patient's preferences and skill level, each recipe broken down into easy-to-follow steps, with instructions as specific as necessary and including lists of the necessary ingredients and utensils. For some patients, multiple copies of forms are necessary so that each step can be marked off as it is completed. For those less severely impaired or those who have come adept at using a variety of compensatory strategies, this technique can be modified into a list of questions, which the individual can ask himself or herself whenever an activity is planned or a decision is necessary.

All of these compensatory techniques as well as others developed for the individual patient can be used in everyday practical situations at home, at work, and at play. They can be incorporated into the head injured person's lifestyle and that of his or her family and friends, allowing him or her the dignity of independence at highest level possible given whatever limitations are present due to the residual sequelae of the injury.

Conclusion

In addition to actual physical and psychological deficits, other factors such as age may play an important role, in determining rehabilitation outcomes in cases of closed head injury. Stress-related mental deficits leading to, for example, irritability and aggressiveness, can in the long term have an increasingly damaging effect on both the client and the immediate family members. Indirectly related factors including the level of support received from family and friends, financial status, and pre-accident personality traits often play a large part in determining outcomes.

Head injuries result in multiple disabilities that typically involve all life functions, including those in the physical, psychological, social, vocational, and educational spheres. Disabilities may include all or some of the following:

Motor impairments; e.g., disorders of movement, posture, dexterity, strength.

Visual impairments; e.g., diplopia, blurred vision. etc.

Activities of daily living; e.g., driving, dressing. etc.

Communication disabilities; e.g., receptive and expressive speech

Psychological disabilities; e.g., cognitive, emotional, behavioral

Social disabilities; e.g., social withdrawal, sexual dysfunction

Vocational disabilities; e.g., inability to return to work

The age of the patient at time of injury and the severity of the injury play a very important part in determining the specific role of the vocational rehabilitation counselor and the types of rehabilitation programs which will have to be initiated for satisfactory outcomes to be achieved. The rehabilitation client born with mild to severe brain injury, regardless of the etiology, will require the rehabilitation counselor to become involved in long-term, life-care planning, the coordination of a team of health-related professionals for meet service delivery, and extensive family counseling and education.

The older child or adult with closed head trauma may partake in many traditional vocational rehabilitation services, but it also may be necessary for the rehabilitation counselor to coordinate cognitive and behavioral remediation programs through appropriate schools or medical centers depending upon the specific needs of the

patient. Whether the individual requires in-patient or outpatient care is dependent upon his ability to live independently in the community, with or without the assistance of family.

Although the severity of disabilities is related to the severity of brain injury, seemingly minor trauma can also produce serious residual dysfunctions. The University of Virginia Medical School research suggests that the sequelae of minor head trauma have been grossly underestimated, especially with respect to emotional and personality disturbances.

Following minor head injury there is often a constellation of symptoms that include deficits in attention and concentration, headache and dizziness, irritability, depression, memory deficits, fatigue, and diplopia.

Table 5 lists the behavioral and emotional impairments, which tend to seriously disable the head-injured patient. Although rather invisible when compared to serious physical disabilities mental deficits are devastating in their pervasiveness and prevent the individual from functioning effectively in all aspects of life.

Mental rather than physical deficits gradually give rise to the most devastating problems to the individual and the family. A serious head injury to a member of the family causes severe psychological, social, and financial strain on the family. It is an enormous burden placed on all members of the family as a result of the injured person's physical and emotional deficits. The emotional and psychological deficits of the injured person tend to be much more debilitating to the family than the possible physical impairments. When we consider the common mental sequelae of head injury-irritability, aggressiveness, memory deficits, impatience, egocentrism, fatigue, immaturity, demanding, social inappropriateness, etc. - it is not surprising that families cannot bear up under the enormous strain.

Table 5- Mental Deficits*

Personality or Behavioral Construct	Changes caused by Head Injury
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Capacity for social perceptiveness	Self-centered behavior Diminution or total loss of self-criticism Loss of ability to show empathy
Capacity for self-control	Random restlessness Impatience and impulsivity
Learned social behavior	Diminution in or loss of initiative, power to make judgments, plan and organize
Ability to learn	Mental slowness and rigidity of thought Reduced learning capacity
Emotion	Irritability, silliness, lability of mood, apathy, and increased or diminished sexual drive

*Adapted from Rehabilitation of the Head Injured Adult, M. Rosenthal, 1983.

Family members often feel overwhelmed, trapped, isolated, and emotionally and physically drained. The rehabilitation and recovery from head injury is a slow and arduous process that may cause enormous stress on the family unit for many years after the time of accident. Often the damage to the family unit and to individuals within the family rivals the damage to the victim, in terms of the social, psychological, and emotional consequences of injury.

The degree to which an individual himself is able to cope with and compensate for the devastating effects of brain injury is independent on a number of factors:

- (1) Pre-morbid: personality, education and intellectual capacity; social, financial, and vocational status;
- (2) Family: support, tolerance, and environment;
- (3) Support from friends and the community; and
- (4) Rehabilitation opportunities.

It is clear to see that the range of impairments can vary significantly with many individuals able to return to the same or similar work when minimal or mild sequelae exist secondary to the brain trauma. Many others will have varying degrees of vocational handicaps and limitations in worker trait groups and vocational tasks with a small percentage demonstrating permanent and total disability. The rehabilitation counselor can gain some insight into the

potential types of sequelae including: vocational handicaps which will result from brain injury by making a determination as to the primary location of brain lesions: left-side brain lesions will impact verbal communication but non-verbal communication skills may remain unimpaired. As always each case must be evaluated on an individual basis for determination of sequelae including vocational handicaps and functional limitations.

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