Integrating Cognitive Strategies into the Physical Therapy Setting
Danese Malkmus

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Effectively integrating cognitive management concepts into the physical therapy setting is dependent upon an adequate understanding of the cognitive and behavioral consequences of head injury and the appropriate use of diagnostic and prognostic cognitive data as a basis for program design. The intent of this article is to provide a framework for simultaneously addressing the physical and cognitive consequences of head injury. Behavioral manifestations of cognitive dysfunction and a means of clinically observing and assessing patient performance are provided as a basis for program design. Specific examples of treatment strategies applicable to various phases of cognitive recovery are described.

Key Words: Cognition, Cognition disorders, Head injuries, Physical therapy.

Rehabilitating the head-injured patient requires reintegrating individual capacities within the limitations imposed by craniocerebral trauma and subsequent CNS damage. Jennett and Teasdale indicated that the most consistent and debilitating consequence of a head injury is some disorder of mental functioning, either temporary or permanent. Bond's study on psychosocial outcome of severe head injury indicated that family cohesion is affected more negatively by mental decline than by physical disability. Griffith, Ben-Yishay and Diller and others confirm the high frequency and significance of cognitive impairment after craniocerebral trauma.

The neurobehavioral consequences of head injury concern the professionals involved in rehabilitative management. For those trained and skilled in physical rehabilitation, the cognitive, linguistic, emotional, and social consequences of head injury are areas of major consideration in designing and implementing treatment programs. Most training programs provide little preparation for effective management of these areas. In working with head-injured individuals, the clinician soon realizes that traditional disciplinary boundaries, roles, and approaches frequently are ineffective. A therapist cannot address the head-injured individual's physical deficits without also addressing the cognitive and behavioral consequences of the injury. The head-injured patient offers the clinician a significant challenge, which is the need to transcend traditional, isolated rehabilitation approaches to effect optimal management and outcome.

All professionals in the rehabilitative management of head-injured patients are involved with the patients' environment and with the behaviors demonstrated by the patients within that environment. Therefore, all professionals have the potential for facilitating increased cognitive-behavioral function. The ability to influence the cognitive recovery process positively, while simultaneously addressing physical management objectives, is dependent on possessing a working knowledge of the relationship of cognition to behavior, the pattern of cognitive-behavioral recovery after a head injury, and the strategies effective in promoting such recovery. Given a basic understanding of these factors, the selection, timing, and sequencing of physical strategies and techniques become clear, and the desired outcome is achieved more rapidly and easily.

This article provides the physical therapist with an enhanced understanding of the relationships of normal and pathological cognitive function to behavioral performance and a means of observing and assessing patient performance as a basis for determining and assessing clinical procedures. The primary thrust of the article is to illuminate the potential of the physical therapist for contributing to interdisciplinary cognitive management and to offer suggestions and examples for incorporating cognitive strategies into the physical therapy setting.

MANIFESTATIONS OF IMPAIRED COGNITIVE FUNCTION

Behavior may be viewed as a product of mental or cognitive events. These events result from the interaction of cognitive processes that comprise a set of
internal structuring mechanisms. This internal or mental structure provides the mechanism for processing both internal and external information. Internal information entails such “things” as thoughts and emotions; external information comes from the environment through one’s sensory channels. Cognitive processes such as arousal and attentional mechanisms, analysis and discrimination, organization, association, categorization, integration or information synthesis, and mechanisms involved in the encoding storage and retrieval phases of memory contribute to the formation of internal or mental structure and information processing. Other mechanisms contributing to cognitive function are those involved in the initiation, direction, suppression, and redirection of mental activity. Adequate cognitive function involves selective, goal-directed processing activity. It underlies, supports, and generates covert and overt behaviors. The integrity of an individual’s behavioral responses is directly related to the integrity of the cognitive processes that serve as their foundation and generator and to the integration of these cognitive processes, that is, how they function together as a whole.

Typically, stimuli from the internal and external environments are fluctuating and random. Structure and stability are imposed by the selective focusing of cognitive processes on relevant environmental elements. Diffuse craniocerebral trauma disrupts the neural structures that subserve cognitive-behavioral functions. This disruption results in a concomitant disruption of the internal cognitive structure necessary for bringing organization and stability to the individual’s internal and external environments. Such a breakdown in internal structuring mechanisms, or cognitive function, results in the individual’s inability to effect and maintain an appropriate balance or relationship between self and environment. The aberrant behaviors initially manifested by the head-injured patient are directly related to impaired cognitive function and the individual’s attempts to function in an environment beyond his processing capacity.

The neurobehavioral changes in the head-injured population have a direct relationship to the structural changes in brain tissue that are a consequence of the impact of primary forces on the cranium and the secondary, pathological processes that further disrupt and displace tissue. Although each injury and each head-injured individual are unique, the neurobehavioral changes subsequent to diffuse craniocerebral trauma have many common characteristics. Once the brain is no longer able to initiate, direct, suppress, and redirect mental activity adequately, the behavioral display of impaired cognition may include confusion; disorientation; impairment of attention, memory, and learning; disorganization of verbal and nonverbal activity; and incompleteness of thought and action. Responses may be stimulus-bound, so that the individual is unable to disengage from an isolated, irrelevant stimulus. At other times, he may be stimulus-dependent and encounter difficulty planning, implementing, and expanding thought and related activity independent of an external stimulus. Difficulty monitoring, inhibiting, and shifting mental sets and, thus, behaviors, further reflects cognitive impairment. The individual can no longer structure and modify mental processes nor deal differentially with the multitude of stimuli normally available. He can no longer mentally structure external stimuli, fluidly shift cognitive sets as his environment changes nor structure and modify his emotional reactions to those changes. Thus, the behavioral chaos demonstrated after craniocerebral trauma is the result of cognitive chaos. The behavioral chaos reflects the head-injured individual’s neurologically inadequate attempts to abate the cognitive chaos. If allowed to continue, these nonproductive, aberrant behaviors may continue indefinitely, impeding all areas of rehabilitative management. Ultimately, these behaviors become ingrained patterns of inappropriate behavior.

**COGNITIVE REHABILITATION**

In its broadest sense, cognitive rehabilitation is a two-fold process of intervention. It involves implementing direct treatment strategies that address the specific causal factors responsible for the breakdown in behavioral performance and indirect, complementary strategies directed toward the individual’s performance and the environment in which performance occurs. In other words, direct cognitive intervention is directed toward the head-injured individual’s internal environment or those disrupted cognitive mechanisms that impose a negative effect on behavioral function. Indirect strategies address reorganization and reinforcement of behavioral function and are directed toward modifying the external environment.

The success of cognitive intervention depends on using both approaches: systematic reorganization of cognitive function and environmental alteration that reduces compounding sources of cognitive disruption and increases patient performance. The enormity of this task only serves to point out the need for the participation of all professionals involved in managing head-injured patients.

**Assessing Behavioral Responses**

Recovery of cognitive function follows a pathway that is predictable and that may be described in behavioral terms. As spontaneous neurologic recovery ensues and cognitive capacity increases, the head-injured individual’s capacity to generate a greater number, variety, frequency, duration, and quality of
behavioral responses increases. These verbal and non-verbal responses may be assessed using standardized testing methods or by observation and scaling systems. Observation and scaling of behavioral responses is especially important during the early recovery phase when the individual lacks sufficient cognitive capacity to cooperate with testing.

One means of scaling and categorizing behaviors is available by using Levels of Cognitive Functioning, a behavioral scale representing the progression of cognitive recovery as demonstrated through behavioral change (Appendix). This scale provides descriptions of behaviors frequently observed as positive neurologic change, and increased cognitive integrity occurs over time. In describing the dynamics of cognitive recovery, the scale offers a common vocabulary and a baseline for establishing and assessing treatment goals and techniques relative to cognitive capacity. Analyzing the behaviors of a head-injured individual provides guidelines for the timing of physical strategies and for strategies to improve cognitive function. Identifying behavioral capacity offers a framework for appropriate expectations and interactions with the cognitively impaired individual.

Level of cognitive functioning is determined by observing patient responses within normally random and fluctuating environments and in more structured environments where stimuli are purposefully manipulated by the therapist. The therapist may alter the amount, complexity, rate, and duration of environmental stimuli presented at any given time while observing the effect on patient performance. The degree of consistency and predictability of the environment should be considered in relationship to behaviors demonstrated by the patient. The type of behavior demonstrated, the type of stimulus precipitating the behavior and the frequency, consistency, and duration of the behavior should be noted. Applying these observation components will be discussed in relationship to cognitive levels later in this article.

These observations are important not only for determining an individual's level of cognitive functioning or predominant behavioral characteristics, but to delineate how patient performance may be affected positively or negatively in the treatment setting. Although the neurologic basis of cognitive disruption cannot be altered, performance can be enhanced when the environment is altered to compensate for cognitive impairment.

To simplify approaches for managing head-injured patients, the Levels of Cognitive Functioning may be grouped into four basic recovery phases and their respective management approaches (Table).11

### Strategies for Decreased Response Levels

Frequently, the physical therapist is the only allied health professional consulted during the earliest phase of recovery from a head injury. Thus, the physical therapist is in an ideal position to address not only physical management concerns, but the individual's depressed state of responsiveness. A sensory stimulation program may be constructed and taught to nursing personnel, family members, and others having patient contact during the acute phase. Stimulation that may increase intracranial pressure, however, should be avoided. Physician consultation and approval should be obtained before implementing a program.

This approach provides an organized presentation of heightened sensory input to prevent further sensory deprivation, to encourage responsiveness to external input, and to monitor and to assess cognitive status. The approach assumes that the individual has the capacity to generate responses to certain types of sensory input when appropriately presented but acknowledges that injury may have impaired one or more sensory channels. Therefore, the therapist should assess responses to many types of stimuli presented to each sensory channel. Assessment is repeated at various times of the day over a period of time sufficient to determine times of maximum alertness and types of stimulation likely to elicit responses. Once this is determined, sessions are scheduled accordingly to gain optimal response.13

Because the individual's ability to maintain an optimal state of responsiveness is limited, stimulation should be provided at least several times daily but in relatively brief sessions of 15 to 30 minutes. The length of time varies according to the time needed to effect arousal and the individual's capacity to maintain a responsive state. Stimuli should be meaningful to individual interests and preferences when possible. For example, a familiar voice or object is likely to have stronger stimulus value than unfamiliar auditory or visual stimuli. The therapist should present stimuli in an orderly manner to one input channel at a time to avoid sensory overload and to determine which stimulation produces the greatest response from the individual. A brief explanation of the stimuli should be given to the patient before, during, and after stimulus presentation. Explanation and stimulus pre-

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**TABLE**

<table>
<thead>
<tr>
<th>Level</th>
<th>Recovery Phase</th>
<th>Approach</th>
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<tbody>
<tr>
<td>II, III</td>
<td>decreased response</td>
<td>stimulation</td>
</tr>
<tr>
<td>IV</td>
<td>agitated response</td>
<td>structure</td>
</tr>
<tr>
<td>V, VI</td>
<td>confused response</td>
<td>structure</td>
</tr>
<tr>
<td>VII, VIII</td>
<td>automatic response</td>
<td>community</td>
</tr>
</tbody>
</table>

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sentation should not be simultaneous. Although the individual may demonstrate limited capacity to respond to certain types of input, ongoing assessment of responses to various types of stimulation is crucial to monitoring progress and upgrading the program. It is equally important to avoid overstimulating individuals with severely limited response capacity. Ideally, a balance of stimulation and rest is achieved throughout the day that results in optimal responsiveness during stimulation sessions. The individual is more likely to be responsive when positioned in a reclining wheelchair or on a tilt table in the treatment area. The act of moving the patient to the equipment and positioning and interacting with him verbally provides cutaneous, kinesthetic, and auditory stimulation that may contribute to increased arousal and responsiveness. Upright positioning also provides a more normal visual plane and change of visual environment. When the patient is restricted to his bed, visual, auditory, olfactory, cutaneous, gustatory, and kinesthetic stimulation may be brought to the individual. The therapist may find it useful to organize a sensory stimulation kit containing a variety of stimuli to carry to the bedside. Objects of various colors for visual stimulation, different textures for cutaneous stimulation, various sounds for auditory stimulation, and an assortment of scents for olfactory stimulation are useful items. Stimuli should be organized into categories, such as visual or cutaneous, and only one type of stimulus used at a time. When at bedside, the therapist may introduce large, brightly-colored objects and encourage the patient to focus on the stationary stimulus. If that is accomplished, the therapist may move the visual stimulus gradually, encouraging vertical and horizontal tracking. Positioning programs, range-of-motion exercises, and oral and body hygiene provide cutaneous and kinesthetic input. These daily care routines may be integrated into the stimulation program and the patient’s responses monitored and assessed. I recommend maintaining a 24-hour record of stimulus input and response that is completed by all persons in contact with the individual. These strategies also may be used in the treatment area. Within the treatment setting, extraneous noise and visual stimuli should be eliminated or minimized. Activities such as placing the patient on a bolster, large ball, or rocking board may elicit protective responses or delayed but present balance reactions while providing vestibular, proprioceptive, and tactile stimulation. Intraoral and extraoral tactile stimulation may diminish tactile defensiveness and reflex dominated responses while increasing arousal and responsiveness. As responsiveness increases, efforts should be directed toward increasing the frequency, consistency, variety, rate of response, response duration, and the ability to focus and sustain attention on a specific stimulus or activity. In this way, a foundation for patient participation in the treatment process is established. Once minimal attention and participation are achieved, responses may be channeled into an activity used to facilitate increased focused attention and information processing. Simple activities requiring the patient to attend to, discriminate, and emit a motor response will facilitate reaching this goal. Catching and throwing a ball, hitting a tether ball, completing a step in a self-care sequence, or one-step activities such as selecting one of two colors, shapes, or sizes are examples of these activities. Strategies for Agitated Response Level Agitation may be described as a transition from minimal responsiveness to severe confusion. The behaviors demonstrated by the agitated patient represent confusion in its most severe form. During this phase of recovery, the individual responds primarily to his state of internal confusion and disorganization. He is essentially unable to attend to, to discriminate, and to process environmental stimuli or to monitor and to inhibit his responses. He is alert and has progressed from a state of hypoarousal to one of hyperarousal but is incapable of cognitively generating planned behavioral action. Frequently, his disinhibited, bizarre, and, possibly, combative behaviors are viewed as psychotic, regressive, or uncooperative. This phase of recovery, however, represents progress and evolving cognitive recovery. Furthermore, the behaviors are representative of a very frightened individual who lacks the neurologic and cognitive capacities to understand his situation. Measures such as isolation and medication usually have little if any desirable effect; they tend to increase rather than decrease agitation. Psychotropic medication used to depress agitation frequently must be given in massive doses to be successful. Massive doses serve to depress cognitive function further and may cause undesirable side effects. The goal for this recovery phase is singular and behavioral: progress the individual to the next level of cognitive functioning. Effort is directed toward decreasing the intensity, frequency, and duration of agitated responses and increasing attention to the external environment. Such effort cannot be the sole responsibility of the nursing staff. Allied health professionals also can provide the time and resources to manage this recovery phase effectively. As agitation becomes apparent, assessment consists of determining which environmental stimuli precipitate, elicit, and increase agitated behaviors. Sources of agitation should be eliminated when possible or, at least, minimized. Assessment also includes determining stimuli that calm the individual. Stimuli or activ-
ities that decrease the intensity, frequency, and duration of agitated behavior are the mechanisms for increasing attention to the environment and moving the individual through this recovery phase.\textsuperscript{11, 12}

In most cases, human contact diminishes agitation, if only for brief periods of time. Noisy, heavily populated areas tend to increase confusion and, thus, agitation. Devices such as catheters, restraints, and nasogastric tubes are unfamiliar and uncomfortable. They compound agitation and should be avoided if possible. A soothing tone of voice; verbal reassurance; orientation to time, place, and situation; gentle but firm touching; or a drink or finger food frequently have positive effects on behavior. Placing the individual in a quiet, highly structured group setting, without demanding participation, often proves beneficial. Providing direction to the activity but allowing freedom of movement in a wheelchair or during ambulation in a quiet area absorbs physical energy and diminishes hyperactivity. Frequently, the individual can be engaged briefly in simple, automatic gross motor and self-care activities. If the therapist initiates the activity by handing an object or article to the patient, the individual may automatically participate. Activities must be changed frequently because of the patient's severely limited attention span. By frequently changing the activity, the therapist is able to keep the patient engaged in brief but appropriate interactions, which prolong attention span and reduce agitation.\textsuperscript{11, 12}

The approaches previously suggested are intended for the individual emerging from a decreased level of response to a heightened state of confusion. For effective management, this phase of confusion has been separated from the others. The strategies described are not intended for the individual who has a habituated set of agitated behaviors, that is, the individual with a behavior disorder. When managed effectively, the individuals described in this article usually progress through this phase in two to four weeks. Although each of the approaches described is not successful with every individual, the therapist usually can determine and implement effective strategies. Such management certainly serves as a viable alternative to isolation, restraints, medication, or placement on a psychiatric unit.

Strategies for Confused Response Levels

A structured approach also is used for confused individuals who have progressed through the agitated phase of recovery. These individuals continue to present severe cognitive impairment. Depending on the severity of confusion experienced, they may behave inappropriately or appropriately. Some degree of agitation may persist, but it is in direct response to what is occurring in the environment. The approach for patients functioning at a confused and inappropriate or confused but appropriate level of cognitive functioning is to provide sufficient environmental structure to compensate for persistent cognitive impairment and to facilitate optimum performance.

In the physical therapy setting, the activity and the interaction between patient and therapist should be assessed relative to the amount, complexity, rate, and duration of information provided at any time. For example, the number of steps in an activity, the degree of cognitive difficulty, the rate at which the activity is presented and carried out, and the duration of activity may exceed the patient's cognitive capacity. If the patient cannot comply with the requirements of the activity, the therapist may alter any or all of the components to determine the effect on behavioral performance. For example, the complexity or difficulty of an activity may be reduced for some individuals if verbal directions are eliminated or minimized and visual demonstration and cues are substituted. The number of steps in an activity may exceed the patient's attention span and short-term memory capacities. Participation may be enhanced by breaking down an activity sequence into its component parts and proceeding one step at a time. Initially, the individual may complete only one or two steps in the sequence. Performance also may depend on verbal or physical assistance from the therapist. The rate at which instruction is provided and the rate at which the patient carries out the activity should be assessed. Frequently, when rate is reduced, performance escalates. Providing clear, concise instructions at a reduced rate of speech allows the confused patient more time to process the information. Monitoring and reducing the rate at which the patient performs an activity or the steps in an activity allows him sufficient time to remember, organize, and carry out the appropriate behaviors. The duration of an activity sequence also is important to successful performance. Activities that exceed a patient's attention span or tolerance for frustration should be reduced in duration or eliminated until cognitive capacity increases. The physical therapist also should assess the treatment environment and how it affects patient performance. The decor and arrangement of the room, the number of patients and therapists, and the activity level may serve to compound confusion and reduce appropriate performance. The consistency of the approach, instructions, and treatment environment should be assessed. Ideally, the confused patient's schedule, treatment setting, activities, instructions, and treatment personnel are consistent from day to day.\textsuperscript{11}

In determining and assessing a treatment program for the confused patient, successful and appropriate responses are of greater consequence than the activity itself. In contributing to the cognitive rehabilitation
of this patient, the therapist is working toward effecting consistently appropriate responses and facilitating recovery of the impaired cognitive processes. The activity is less important than the effect it has on the individual’s attention, retention, organization, and sequencing skills. The confused patient may cognitively benefit from simple, repetitive exercises. Breaking down repetitions into short sets and asking the individual to count them aloud causes him to focus and maintain his attention on the activity. This goal may be accomplished in individual sessions or, for example, in a mat class designed to achieve cognitive goals of increased attention to and retention and following of directions. Maintaining a consistent routine from day to day and encouraging recall of the activity and its steps promote memory function. Frequent orientation to time, place, therapist’s name, and activity performed provides predictability, enhances memory, and reduces confusion. As cognitive function improves, the cognitive and physical demands and variety of activities may be increased gradually.11

Functional training is best achieved in a setting with minimal distractions, using a structured approach (see Rinehart in this issue). As the activity is mastered, more normal environments or distractions may be incorporated. Carry-over of performance into other settings cannot be assumed, as learning is situation-dependent for each head-injured patient. Training must be provided in each setting in which the activity is to be accomplished to assure safe performance. Attempts to teach unnecessary functional skills, such as wheelchair transfers to an individual who will become ambulatory, should be avoided. Such a task makes unnecessary demands on diminished memory and is an inefficient use of time. Equipment needs for functional goals should be assessed early, and repetitive training should be implemented to take into account any persistence of memory dysfunction. Caution should be taken in defining ambulatory status. Although the confused patient may be capable of independent ambulation on a physical basis, he may need supervision because of reduced cognitive function. Frequently, an indication of independent ambulation in the inpatient chart results in premature discharge. Describing the ambulation of the confused patient as independent to the family often leads to inappropriate expectations and may place the safety of the patient at risk.

Strategies for Automatic Response Levels

Within the familiar, predictable rehabilitation setting, individuals in this phase of recovery appear goal-directed and frequently able to perform activities of daily living with physical independence. During the previous recovery phase, a structured program adapted the environment to the individual’s cognitive status and needs. Structure allowed him to function in spite of reduced cognition and facilitated cognitive recovery. Over time, he adapted to the structured environment while function gradually improved. Although cognitive function also is improved at this phase of recovery, if environmental structure and predictability are altered, performance will be altered as well. The individual’s inability to integrate his increased cognitive, physical, and emotional capacities into the real world will become apparent.11

A community-based approach provides the head-injured individual an opportunity for reality testing and assistance in adapting his capacities to more complex environments. Concurrently, the program provides the therapist with crucial information about the actual functional status of the patient and what type of intervention may improve it. This approach gradually reduces structure while increasing the individual’s self-responsibility. Activities are selected to promote and integrate cognitive growth and physical adaptation for the increased demands the community holds. These demands can be divided into three areas: activities related to self, home, and community. In each area, performance demands increase as structure is gradually reduced. Rehearsal, repeated training and practice, and patient-therapist feedback and problem solving are an integral part of the process.11

Within the rehabilitation setting, self-responsibilities may include awakening on time, selecting appropriate clothing, initiating hygiene, dressing and grooming, and arriving at appointments on time. The physical therapist may arrange to provide treatment to other individuals on the patient’s unit during this time to observe and assess cognitive and physical performance during these activities. Other activities may include appropriate use of unscheduled time, understanding the function of adaptive equipment, and setting up and performing routine activities or exercises. The physical therapist is important to the training, monitoring, and assessing of these activities.11

Home activities such as stripping and making the bed, organizing and maintaining personal supplies, doing laundry, and preparing a meal provide further opportunity for assessment and training. Performing community activities, such as using public transportation, crossing the street, or marketing, are opportunities for assessing functional status. For example, the ambulatory individual who crosses the street unsafely cannot be considered an independent community ambulator. As in earlier recovery phases, functional status must be assessed relative to cognitive capacity and the individual’s judgment and safety.11 During this phase of recovery, the patient’s improved cognitive function also allows the physical therapist abundant opportunity to refine motor-control functions.
SUMMARY

This article has attempted to clarify the neurobehavioral consequences of head injury and the expanding role of the physical therapist in integrating cognitive strategies into patient management. Central to this issue is establishing short-term goals appropriate to the head-injured individual's cognitive capacity. Each set of goals should be viewed as steps in a sequence leading to desired behavioral objectives that are consistent with cognitive prognosis. As a member of the interdisciplinary team who works consistently with the head-injured patient, or in some cases, the only professional providing treatment services, the physical therapist is in an ideal position to use strategies that will promote cognitive and physical recovery. When the therapist works in an interdisciplinary setting, appropriate cognitive goals and guidance are available from those trained to assess and alleviate cognitive dysfunction. Professionals such as clinical neuropsychologists, speech-language pathologists, and learning disability specialists welcome the opportunity to provide direction. Professionals in all disciplines involved in managing head-injured patients can make appreciable contributions to cognitive management. This article provided a framework and guidelines to encourage the physical therapist's participation and to discourage the concept of brain-body dichotomies that further fragment the head-injured patient and impede optimal outcomes.

APPENDIX

Levels of Cognitive Functioning

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<thead>
<tr>
<th>Level</th>
<th>Behaviors Typically Demonstrated</th>
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<tbody>
<tr>
<td>I. No Response: Patient appears to be in a deep sleep and is completely unresponsive to any stimuli.</td>
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<tr>
<td>II. Generalized Response: Patient reacts inconsistently and nonpurposefully to stimuli in a non-specific manner. Responses are limited and often the same regardless of stimulus presented. Responses may be physiological changes, gross body movements, and/or vocalization.</td>
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<tr>
<td>III. Localized Response: Patient reacts specifically but inconsistently to stimuli. Responses are directly related to the type of a stimulus presented. May follow simple commands in an inconsistent, delayed manner, such as closing eyes or squeezing hand.</td>
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<tr>
<td>IV. Confused-Agitated: Patient is in heightened state of activity. Behavior is bizarre and nonpurposeful relative to immediate environment. Does not discriminate among persons or objects; is unable to cooperate directly with treatment efforts. Verbalizations frequently are incoherent and/or inappropriate to the environment; confabulation may be present. Gross attention to environment is very brief; selective attention is often nonexistent. Patient lacks short-term and long-term recall.</td>
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<tr>
<td>V. Confused, Inappropriate: Patient is able to respond to simple commands fairly consistently. However, with increased complexity of commands or lack of any external structure, responses are non-purposeful, random, or fragmented. Demonstrates gross attention to the environment, but is highly distractible and lacks ability to focus attention to a specific task. With structure, may be able to converse on a social-automatic level for short periods of time. Verbalization is often inappropriate and confabulatory. Memory is severely impaired, often shows inappropriate use of objects; may perform previously learned tasks with structure but is unable to learn new information.</td>
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<tr>
<td>VI. Confused-Appropriate: Patient shows goal-directed behavior, but is dependent on external input for direction. Follows simple directions consistently and shows carry-over for relearned tasks with little or no carry-over for new tasks. Responses may be incorrect due to memory problems but appropriate to the situation; past memories show more depth and detail than recent memory.</td>
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<tr>
<td>VII. Automatic-Appropriate: Patient appears appropriate and oriented within hospital and home settings; goes through daily routine automatically, but frequently robot-like with minimal-to-absent confusion, but has shallow recall of activities. Shows carry-over for new learning, but at a decreased rate. With structure is able to initiate social or recreational activities; judgment remains impaired.</td>
<td></td>
</tr>
<tr>
<td>VIII. Purposeful and Appropriate: Patient is able to recall and integrate past and recent events and is aware of and responsive to environment. Shows carry-over for new learning and needs no supervision once activities are learned. May continue to show a decreased ability relative to premorbid abilities, abstract reasoning, tolerance for stress, and judgment in emergencies or unusual circumstances.</td>
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* Abbreviated version from Hagen, Malkmus and Durham.8, 9
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