

## **Sowing the Seeds of Recovery**

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- Objectives:
1. Provide an overview of the continuum of care for clients following a Traumatic Brain Injury.
  2. Describe the stages of recovery and associated functional deficits following Traumatic Brain Injury.
  3. Identify the role of the client's personal support system in recovery and return to home and work environments.
  4. Explore professional resources available to assist in community/work reintegration.

## **Glasgow Coma Scale**

The Glasgow Coma Scale is scored between 3 and 15. 3 being the worst and 15 being the best. It is composed of three parameters: Best Eye Response, Best Verbal Response, and Best Motor Response. See below:

### **Best Eye Response (4)**

1. No eye opening.
2. Eye opening to pain.
3. Eye opening to verbal command.
4. Eyes open spontaneously.

### **Best Verbal Response (5)**

1. No verbal response.
2. Incomprehensible sounds.
3. Inappropriate words.
4. Confused
5. Oriented

### **Best Motor Response (6)**

1. No motor response.
2. Extension to pain.
3. Flexion to pain.
4. Withdrawal from pain.
5. Localizing pain.
6. Obeys commands.

Note that the phrase “Glasgow Coma Scale of 11” is essentially meaningless. It is important to break the figure down into its components, such as “Eye-3, Voice-3, Motor-5=Glasgow Coma Scale of 11”.

A Coma Scale of 13 or higher correlates with a mild brain injury. 9 to 12 is a moderate injury and 8 or less a severe brain injury.

Teasdale G., Jennett B., LANCET (ii) 81-83, 1974.

Also posted on: <http://www.trauma.org/scores/gcs.html>

## **Rancho Los Amigos-Revised 10 Level Scale**

### Levels of Cognitive Functioning

#### Level I- No Response: Total Assistance

- Complete absence of observable change in behavior when presented visual, auditory, tactile, proprioceptive, vestibular or painful stimuli.

#### Level II- Generalized Response: Total Assistance

- Demonstrates generalized reflex response to painful stimuli.
- Responds to repeated auditory stimuli with increased or decreased activity.
- Responds to external stimuli with physiological changes generalized, gross body movement and/or not purposeful vocalization.
- Responses noted above may be same regardless of type and location of stimulation.
- Responses may be significantly delayed.

#### Level III- Localized Response: Total Assistance

- Demonstrates withdrawal or vocalization to painful stimuli.
- Turns toward or away from auditory stimuli.
- Blinks when strong light crosses visual field.
- Follows moving object passed within visual field.
- Responds to discomfort by pulling tubes or restraints.
- Responds inconsistently to simple commands.
- Responses directly related to type of stimulus.
- May respond to some persons (especially family and friends) but not to others.

#### Level IV- Confused/Agitated: Maximal Assistance

- Alert and in heightened state of activity.
- Purposeful attempts to remove restraints or tubes or crawl out of bed.
- May perform motor activities such as sitting, reaching and walking but without any apparent purpose or upon another's request.

- Very brief and usually non-purposeful moments of sustained alternatives and divided attention.
- Absent short-term memory.
- May cry out or scream out of proportion to stimulus even after its removal.
- May exhibit aggressive or flight behavior.
- Mood may swing from euphoric to hostile with no apparent relationship to environmental events.
- Unable to cooperate with treatment efforts.
- Verbalizations are frequently incoherent and/or inappropriate to activity or environment.

#### Level V- Confused, Inappropriate Non-Agitated: Maximal Assistance

- Alert, not agitated but may wander randomly or with a vague intention of going home.
- May become agitated in response to external stimulation, and/or lack of environmental structure.
- Not oriented to person, place or time.
- Frequent brief periods, non-purposeful sustained attention.
- Severely impaired recent memory, with confusion of past and present in reaction to ongoing activity.
- Absent goal-directed, problem-solving, self-monitoring behavior.
- Often demonstrates inappropriate use of objects without external direction.
- May be able to perform previously learned tasks when structured and cues provided.
- Unable to learn new information.
- Able to respond appropriately to simple commands fairly consistently with external structures and cues.
- Responses to simple commands without external structure are random and non-purposeful in relation to command.
- Able to converse on a social, automatic level for brief periods of time when provided external structure and cues.
- Verbalizations about present events become inappropriate and confabulatory when external structure and cues are not provided.

Level VII- Automatic, Appropriate: Minimal Assistance for Daily Living

- Consistently oriented to person and place, within highly familiar environments. Moderate assistance for orientation to time.
- Able to attend to highly familiar tasks in a non-distraction environment for at least 30 minutes with minimal assist to complete tasks.
- Minimal supervision for new learning.
- Demonstrates carry over of new learning.
- Initiates and carries out steps to complete familiar personal and household routine but has shallow recall of what he/she has been doing.
- Able to monitor accuracy and completeness of each step in routine personal and household ADLs and modify plan with minimal assistance.
- Superficial awareness of his/her condition but unaware of specific impairments and disabilities and the limits they place on his/her ability to safely, accurately and completely carry out his/her household, community, work and leisure ADLs.
- Minimal supervision for safety in routine home and community activities.
- Unrealistic planning for the future.
- Unable to think about consequences of a decision or action.
- Overestimates abilities.
- Unaware of others' needs and feelings.
- Oppositional/uncooperative.
- Unable to recognize inappropriate social interaction behavior.

Level VIII- Purposeful, Appropriate: Stand-By Assistance

- Consistently oriented to person, place, and time.
- Independently attends to and completes familiar tasks for 1 hour in distracting environments.
- Able to recall and integrate past and recent events.
- Uses assistive memory devices to recall daily schedule, "to do" lists and record critical information for later use with stand-by assistance.
- Initiates and carries out steps to complete familiar personal, household, community, work and leisure routines with stand-by

assistance and can modify the plan when needed with minimal assistance.

- Requires no assistance once new tasks/activities are learned.
- Aware of and acknowledges impairments and disabilities when they interfere with task completion but requires stand-by assistance to take appropriate corrective action.
- Thinks about consequences of a decision or action with minimal assistance.
- Overestimates or underestimates abilities.
- Acknowledges others' needs and feelings and responds appropriately with minimal assistance.
- Depressed.
- Irritable.
- Low frustration tolerance/easily angered.
- Argumentative.
- Self-centered.
- Uncharacteristically dependent/independent.
- Able to recognize and acknowledge inappropriate social interaction behavior while it is occurring and takes corrective action with minimal assistance.

#### Level IX- Purposeful, Appropriate: Stand-By Assistance on Request

- Independently shifts back and forth between tasks and completes them accurately for at least two consecutive hours.
- Uses assistive memory devices to recall daily schedule, "to do" lists and record critical information for later use with assistance when requested.
- Initiates and carries out steps to complete familiar personal, household, work and leisure tasks independently and unfamiliar personal, household, work and leisure tasks with assistance when requested.
- Aware of and acknowledges impairments and disabilities when they interfere with task completion and takes appropriate corrective action but requires stand-by assist to anticipate a problem before it occurs and take action to avoid it.
- Able to think about consequences of decisions or actions with assistance when requested.
- Accurately estimates abilities but requires stand-by assistance to adjust to task demands.

- Acknowledges others' needs and feelings and responds appropriately with stand-by assistance.
- Depression may continue.
- May be easily irritable.
- May have low frustration tolerance.
- Able to self-monitor appropriateness of social interaction with stand-by assistance.

Level X- Purposeful, Appropriate: Modified Independent

- Able to handle multiple tasks simultaneously in all environments but may require periodic breaks.
- Able to independently procure, create and maintain own assistive memory devices.
- Independently initiates and carries out steps to complete familiar and unfamiliar personal, household, community, work and leisure tasks but may require more than usual amount of time and/or compensatory strategies to complete them.
- Anticipates impact of impairments and disabilities on ability to complete daily living tasks and takes action to avoid problems before they occur but may require more than usual amount of time and/or compensatory strategies.
- Able to independently think about consequences of decisions or actions but may require more than usual amount of time and/or compensatory strategies to select the appropriate decision or action.
- Accurately estimates abilities and independently adjusts to task demands.
- Able to recognize the needs and feelings of others and automatically respond in appropriate manner.
- Periodic periods of depression may occur.
- Irritability and low frustration tolerance when sick, fatigued and/or under emotional stress.
- Social interaction behavior is consistently appropriate.

Sources: Chris Hagen, Ph.D., Danese Malkmus, M.A., Patricia Durham, M.A. Communication Disorders Service, Rancho Los Amigos Hospital, 1972. Revised 11/15/74 by Danese Malkmus, M.A., and Kathryn Stenderup, O.T.R.

[www.neuroskills.com](http://www.neuroskills.com) and [www.biausa.org](http://www.biausa.org)

## **Family/Community Roles in Rehabilitation**

- Provide support to patient and each other
- Prevent overstimulation to patient
- Allow rest periods for patient and family/friends
- Provide structure
- Bring in familiar items from home
- Give the “gift of time”

## **Cognitive Deficits after Brain Injury**

Memory- Decreased Long-term Memory (rare)  
Decreased Short-term Memory  
Assistive Devices  
Compensatory Strategies

Attention Span- Distractibility  
Decreased ability to organize information in  
environment  
Compensatory Strategies

Problem-Solving- Decreased decision-making skills  
Decreased abstract thinking  
Decreased speed of response  
Compensatory Strategies

Insight- Decreased awareness of own limitations  
Impulsivity  
Disinhibition  
Confabulation  
Compensatory Strategies

Special needs to address re: long-term cognitive deficits

## **Physical Deficits after Brain Injury**

Hemiplegia- Paralysis, varying degrees  
May involve one limb or two  
Tends to effect balance  
Compensatory strategies

Balance- Decreased due to vestibular system impairment  
Decreased due to hemiplegia or spasticity  
Decreased due to visual impairments  
Compensatory strategies

Spasticity- Decreases ability of limb(s) to function properly  
Causes pain  
Decreases Range of Motion to allow proper reach/gait  
Wider variety of treatment options available

Vision- Neglect  
Field Cut  
Double Vision  
Blurry Vision  
Treatment options

## **Community Reintegration**

Neuropsychological Assessment- Battery of standardized assessments  
Identifies strengths and weaknesses re:  
mental function  
Function vs. Diagnosis  
Valuable guide for rehabilitation,  
educational, and vocational programs

Driving Assessment- see following page from St. Anthony's Health  
Center in Alton, Illinois  
Brain Injury population needs physical and  
cognitive assessment, not just road test  
Should include recommendations for adaptations  
Laws vary state-to-state re: reporting to DMV

Home Assessment- Preferably prior to discharge from hospital  
Typically by the O.T. treating the patient  
ADA guidelines  
Low-cost vs. high-tech options

Worksite Assessment- Preferably prior to discharge from hospital  
Individualization vs. “Common threads”  
Multi-disciplinary approach  
Agrability’s invaluable role

## **Follow-up Services**

Home Physical Therapy, Occupational Therapy, Speech Therapy  
Outpatient Physical Therapy, Occupational Therapy, Speech Therapy  
Physician follow-up (family doctor and rehabilitation doctor)  
Department of Human Services  
Agrability

## **Resources**

Local Independent Living Centers (services vary city-to-city),  
[www.scil.org](http://www.scil.org)  
Brain Injury Association of Illinois, [www.biausa.org/Illinois/bia.htm](http://www.biausa.org/Illinois/bia.htm)  
Brain Injury Association of America, [www.biausa.org](http://www.biausa.org)  
NORA (NeuroOptometric Rehab Association), [www.nora.cc](http://www.nora.cc)  
Centers for Disease Control, [www.cdc.gov/tbi](http://www.cdc.gov/tbi)  
Family Caregiver Alliance, [www.caregiver.org](http://www.caregiver.org)  
RESNA (Rehab Engineering and Assistive Technology Society of North  
America), [www.resna.org](http://www.resna.org)

