
Stages of Recovery

From Injury Toward Independence

After completion of this module, the learner will be able to:

- Identify:
 - the basic stages of recovery.
 - the steps in the rehabilitation continuum.
 - major assessment tools used to communicate diagnosis & prognosis.
 - factors which influence recovery.

- Explain:
 - Factors which influence recovery:
 - Plasticity.
 - New Growth.
 - Rerouting.
 - Time.
 - Healthy Living.
 - The Team.
 - The Individual.

Pre-Quiz – Part 1

True or False.

- T** 1. No two people recover from TBI in the same manner.
- F** 2. Rancho Los Amigos and Glasgow Coma Scale are the only two scales for measuring recovery from TBI.
- T** 3. An individual's work ethic can affect his/her recovery.
- F** 4. Recovery is measured by extent and pace.
- T** 5. Formal rehabilitation is time-limited regardless of the severity of the injury.
- F** 6. Recovery happens in the six months after the injury.
- T** 7. Social integration is a major tenet of rehabilitation.
- T** 8. Rehabilitation begins in the emergency room and/or intensive care unit.
- T** 9. An individual with TBI experiences Kubler-Ross's stages of grief in the loss of their "old self."
- F** 10. Plasticity only applies to children's brains.

Pre-Quiz – Part 2

Put these levels of care in order beginning with care given immediately following the injury.

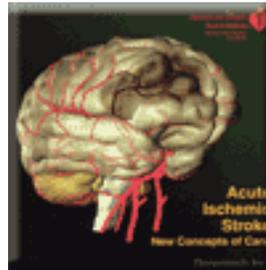
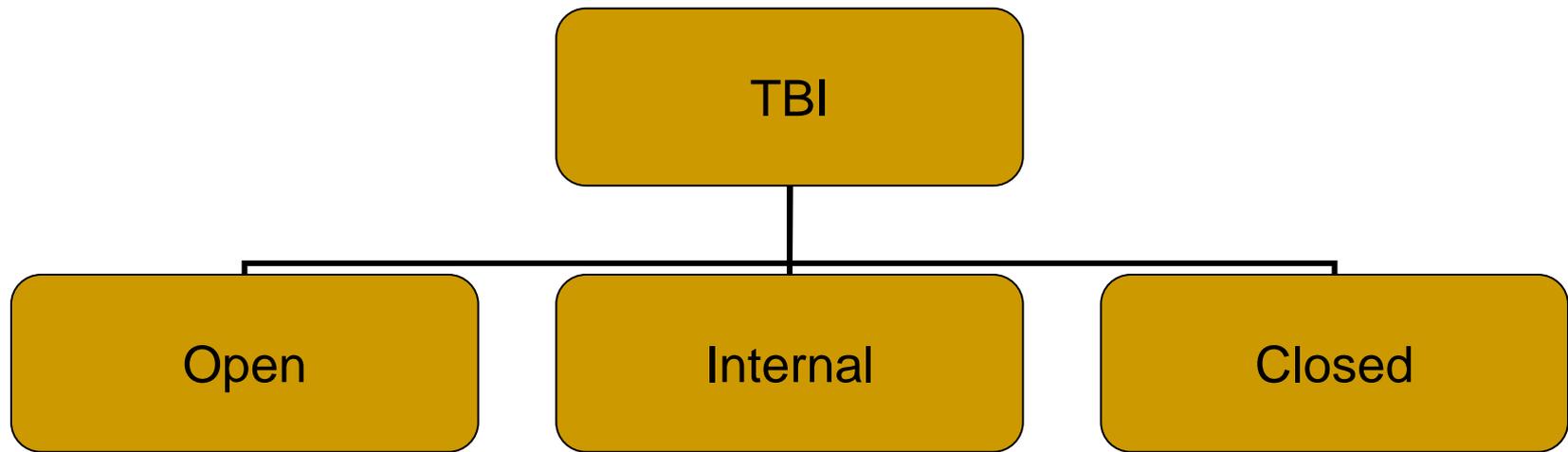
- 9 a. Independent Living Program
- 4 b. Sub-acute rehabilitation
- 6 c. Out-patient therapy
- 5 d. Day treatment
- 1 e. Emergency room
- 7 f. Home health services
- 2 g. Intensive care unit
- 8 h. Community re-entry
- 3 i. Acute rehabilitation

True or False.

Indicate whether each of these items is a factor in an individual's recovery.

- T 1. quality of insurance coverage
- T 2. sense of humor
- T 3. communication within the team
- T 4. insight into impairment(s)
- T 5. ability to admit having a TBI
- T 6. person-centered programming
- T 7. knowledge of rehabilitation systems
- T 8. pre-injury health
- T 9. time
- 10. blaming NEGATIVE FACTOR, NEED TO ADJUST QUESTION

Types of Traumatic Brain Injuries



Traumatic Brain Injury

Definition:

“Brain Injury is an insult to the brain, not of degenerative or congenital nature, the result of either an external physical force or internal cause, that produces an altered mental status, which results in an impairment of behavioral, cognitive, emotional, and/or physical functioning.”

[Vermont Division Disability and Aging Services]

Statistically:

- A TBI occurs every 21 seconds.
- 1.4 million people sustain a TBI annually in the United States.
- 230,000 people hospitalized annually with TBI.
- After 1st TBI, risk for 2nd is 3 times greater.
- After 2nd TBI, risk for 3rd is 8 times greater.
- TBI injuries cost more than \$48.3 billion annually.

[Center for Disease Control, 2007]

Rehabilitation

- “Rehabilitation implies the restoration of the patient to the highest level of physical, psychological, and social adaptation attainable. It includes all measures aimed at reducing the impact of the disability and handicapping conditions. It also aims at enabling disabled people to achieve optimum social integration.”

[World Health Organization, 1986]

- “The process of restoration of skills by a person who has had an illness or injury so as to regain maximum self in a normal or near as normal manner as possible.”

[www.medterms.com]

Facilities and Levels of Care:

- Emergency Room (ER)
- Intensive Care Unit (ICU)
- Acute Rehabilitation
- Subacute Rehabilitation
- Day Treatment
 - (a.k.a. Day Rehab or Day Hospital)
- Outpatient Therapy
- Home Health Services
- Community Re-entry
- Independent Living Programs

Rehabilitation

- **A few points to keep in mind:**
 - Rehabilitation begins almost immediately after injury through:
 - directed sensory stimulation.
 - exercising of muscles and joints.
 - Formal rehabilitation usually has:
 - time limits.
 - outcome requirements.
 - Informal rehabilitation (family, etc.) can go on for a very long time.
 - Progress:
 - greatest visible progress occurs in first 6 months.
 - after 6 months, improvement is more subtle and less obvious.
 - does not stop after an arbitrary period of two years.
 - can continue for the lifetime of the individual.

Stages of Recovery

- This means different things to different people:

- Total recovery
- Coma recovery
- Physical recovery
- Emotional recovery
- Grieving cycle
- Rehabilitation process

- Things to remember:

- No two people recover in the same time frame or manner.
- No matter the severity, all individuals with TBI in recovery go through these stages.
- There are factors which influence an individual's pace and extent of recovery.
- No two professional fields measure stages of recovery with the same scales or levels.

Stages of Recovery – Newest Scale

Disorders of Consciousness Scale (DOCS):

- Northwestern University – first truly reliable measure of neurobehavioral functioning during coma that predicts recover of consciousness up to one year after injury with 86% certainty.
- 8 subscales: social knowledge; taste and swallowing; olfactory; proprioceptive (perception of one's body in space) and vestibular (balance); auditory; visual; tactile; and testing readiness.
- Accurately detected improvements, declines, and plateaus in neurobehavioral functioning of unconscious patients.
- Repeated use improved medical and rehabilitation management during coma recovery.
- Detected previously undetected secondary medical complication, which were successfully treated.

Stages of Recovery - Coma

Glasgow Coma Scale

- 15-point scale:
 - I. Motor Response
 - 6 – Obeys commands fully
 - 5 – Localizes to noxious stimuli
 - 4 – Withdraws from noxious stimuli
 - 3 – Abnormal flexion, i.e. decorticate posturing
 - 2 – Extensor response, i.e. decerebrate posturing
 - 1 – No response
 - II. Verbal Response
 - 5 – Alert and Oriented
 - 4 – Confused, yet coherent, speech
 - 3 – Inappropriate words & jumbled phrases consisting of words
 - 2 – Incomprehensible sounds
 - 1 – No Sounds
 - III. Eye Opening
 - 4 – Spontaneous eye opening
 - 3 – Eyes open to speech
 - 2 – Eyes open to pain
 - 1 – No eye opening

Stages of Recovery - Coma

Glasgow Coma Scale

- Used to estimate and categorize outcomes of TBI on basis of overall social capability or dependence on others.
- Final score determined by adding I + II + III.
- Number communicates to medical workers 4 possible levels for survival (15 = best; 0 = worst).
- Levels:
 - Mild (13 - 15)
 - Moderate Disability (9 – 12)
 - Severe Disability (3 – 8)
 - Vegetative State (Less than 3)
 - Persistent Vegetative State
 - Brain Death
- Based on the severity of the coma, this scale does **NOT** indicate severity or sequelae of long-term impairments

Stages of Recovery – In Hospital

Rancho Los Amigos Cognitive Scale - Revised

- 10-point scale
 - Level I No Response: Total Assistance
 - Level II Generalized Response: Total Assistance
 - Level III Localized Response: Total Assistance
 - Level IV Confused/Agitated: Maximal Assistance
 - Level V Confused, Inappropriate Non-Agitated: Maximal Assistance
 - Level VI Confused, Appropriate: Moderate Assistance
 - Level VII Automatic, Appropriate: Minimal Assistance for Daily Living Skills
 - Level VIII Purposeful, Appropriate: Stand-By Assistance
 - Level IX Purposeful, Appropriate: Stand-By Assistance on Request
 - Level X Purposeful, Appropriate: Modified Independent

Stages of Recovery – In Hospital

Rancho Los Amigos Cognitive Scale - Revised

- Provides feedback to medical staff on effectiveness of rehabilitation involving:
 - Awareness.
 - Cognition.
 - Behavior.
 - Interaction with environment.
- Rehabilitation can be improved if the team responds to changes in the scale over time and therapies.

Stages of Recovery – On-going

National Institute of Neurological Disorders and Stroke lists:

1. **Coma:** totally reliant on medical staff.
2. **Post-Traumatic Amnesia:** severe agitation, restlessness, confusion.
3. **Conscious with Severe Deficits:** attentional, problem-solving, social, and memory deficits; focused on orthopedic or physical injuries.
4. **Awareness:** frustration, irritability, anger, and beginning anxiety and depression due to cognitive deficits; feeling pressure to return to responsibilities; over-estimating abilities and under-estimating problems; emotional lability; lowered tolerance for frustration.
5. **Success When Structured:** experiencing success due to cognitive improvement; complexity exhausts coping skills; increased insightfulness leads to significant depression and anxiety.
6. **Return to Responsibility:** coming to terms emotionally with what has happened and the outcomes; taking on some old responsibilities; experiences failures and fatigue; rebuilding confidence and self-esteem; building new life for self.

Stages of Recovery – On-going

American Speech-Language-Hearing Association lists:

1. **Coma:** unresponsive; eyes closed.
2. **Vegetative State:** no cognitive responses; gross wakefulness; sleep-wake cycles.
3. **Minimally Conscious State:** purposeful wakefulness; responds to some commands.
4. **Confusional State:** recovered speech; amnesic; severe attentional deficits; agitated; hyperaroused; possible labile behavior.
5. **Post-Confusional, Evolving Independence:** resolution of amnesia; cognitive improvement; achieving independence in daily self-care; improving social interaction; developing independence at home.
6. **Social Competence, Community Re-entry:** recovering cognitive abilities; goal-directed behaviors; social skills; personality; developing independence in the community; returning to academic or vocational pursuits.

Stages of Recovery – On-going

Disability Rating Scale for Severe Head Trauma Patients: Coma to Community:

- Based on scales and subscales measuring:
 - Arousability, Awareness, & Responsivity
 - eye opening
 - communication ability
 - motor response
 - Cognitive Ability to for Self-Care
 - feeding
 - toileting
 - grooming
 - Dependence on Others/
Level of Functioning
 - Psychosocial Adaptability/
Employability
- 29-point scale to determine level of disability:
 - 0 No Disability
 - 1 Mild
 - 2 – 3 Partial
 - 4 – 6 Moderate
 - 7 – 11 Moderately Severe
 - 12 – 16 Severe
 - 17 – 21 Extremely Severe
 - 22 – 24 Vegetative State
 - 25 – 29 Severe Vegetative State

Stages of Recovery - Emotional

According to the *Traumatic Brain Injury Survival Guide*, there are 6 stages of emotional recovery:

1. **Confusion and Agitation:** just awakening; can be physically aggressive; for 99% the confusion and agitation recede.
2. **Denial:** 2 types: (1) emotional and (2) cognitive processing problem due to injury.
3. **Anger and Depression:** realizes that abilities have changed; blaming self and/or others; anger can be from: (1) frustration or (2) the injury itself.
4. **Testing Phase:** checking out limits; tendency to overdo; experience failure and fatigue; very painful stage.
5. **Uneasy Acceptance:** learn the abilities and deficits and accept the limits; not happy, but accepting.
6. **Coping:** moving on to develop “new self.”

Stages of Recovery – Family Adjustment

Dr. Debra M. Russell addresses the 6 stages of recovery in family adjustment:

- **Stage 1 (1 - 3 months):** shock; focused on praying for recovery; great hopes for full recovery; develop denial; no TBI experience; repress feelings; avoid discussing severity; transfer negative feelings to others.
- **Stage 2 (3 – 9 months):** begin to recognize the severity; feeling helpless and frustrated; denial turns into anxiety, anger, fear, depression, and loss.
- **Stage 3 (6 – 24 months):** start to get annoyed with the survivor – not trying hard enough; experiencing depression, guilt, and discouragement; starting to recognize the levels of impairment; start seeking information about TBI recovery.
- **Stage 4 (10 – 24 months):** beginning of realism; disability and/or negative behaviors bother family; need additional breaks away to improve tolerance; fear situation is permanent; reduce face-to-face interactions with survivor.
- **Stage 5 (12 – 24 months):** profound sadness; grieving cycle may begin again; mourn loss of way the survivor used to be; beginning to share new future with and for survivor.
- **Stage 6 (2 – 3 years post-injury):** accept that the person may never be the same as before the TBI; accommodate to change family roles; guilt diminishes; creativity in assistance; well versed about TBI; invest time and money on accommodations.

Stages of Recovery - Grief

Dr. Elizabeth Kubler-Ross's Grief Cycle

- Applicable to the loss the survivor and family are experiencing regarding “the old self – pre-TBI.”
- 5 stages:
 - can cycle often
 - don't always go in order



Factors in Recovery

- People:
 - The individual.
 - The family.
 - The team.
- Brain Biology:
 - Plasticity.
 - New growth.
 - Rerouting.
- Time.

Factors in Recovery

Biological factors which can affect the extent and pace of recovery:

- **Plasticity:** ability of the brain to reorganize neural pathways based on new experiences and new learning.
- **New growth:** structural remodeling of neurons and their dendrites over time following death of neighboring neurons.
- **Rerouting:** implantation of wireless brain chip can create artificial connections between different parts of the brain.

Factors in Recovery

Individual factors which can affect the extent and pace of recovery:

- Work ethic.
- Sense of humor.
- Unselfishness.
- Insight.
- Healthy living.
- Co-operation with other members of medical & rehab teams.
- Ability to admit to having a brain injury.
- Use of support groups to talk about frustrations.
- Pre-injury health (physical, mental, and emotional).

Factors in Recovery

- External factors which can affect the extent and pace of recovery:
 - Person-centeredness – Who's it all about?
 - Initial medical response and intervention after the accident.
 - Quality of preventative rehabilitation in ER and ICU.
 - Level of TBI expertise of healthcare professionals.
 - Quality of insurance coverage.
 - Family support, knowledge of systems, and advocacy.
 - Continuum of levels of service and support from hospital to community
 - Communication amongst all members of the team.
- However, two individuals with identical care will not necessarily have the same outcomes, nor recover at the same pace.
- Blaming and finger-pointing do not help the individual's recovery!

Post-Quiz – Part 1

True or False.

- 1. No two people recover from TBI in the same manner. PG 9
- 2. Rancho Los Amigos and Glasgow Coma Scale are the only two scales for measuring recovery from TBI.
- 3. An individual's work ethic can affect his/her recovery. PG 23
- 4. Recovery is measured by extent and pace.
- 5. Formal rehabilitation is time-limited regardless of the severity of the injury. PG 8
- 6. Recovery happens in the six months after the injury.
- 7. Social integration is a major tenet of rehabilitation.
- 8. Rehabilitation begins in the emergency room and/or intensive care unit. PG 7
- 9. An individual with TBI experiences Kubler-Ross's stages of grief in the loss of their "old self." PG 20
- 10. Plasticity only applies to children's brains.

Post-Quiz – Part 2

Put these levels of care in order beginning with care given immediately following the injury.

- 9 a. Independent Living Program
- 4 b. Sub-acute rehabilitation
- 6 c. Out-patient therapy
- 5 d. Day treatment
- 1 e. Emergency room
- 7 f. Home health services
- 2 g. Intensive care unit
- 8 h. Community re-entry
- 3 i. Acute rehabilitation

True or False.

Indicate whether each of these items is a factor in an individual's recovery.

- T 1. quality of insurance coverage
- T 2. sense of humor
- T 3. communication within the team
- T 4. insight into impairment(s)
- T 5. ability to admit having a TBI
- T 6. person-centered programming
- T 7. knowledge of rehabilitation systems
- T 8. pre-injury health
- T 9. time
- 10. blaming NEGATIVE FACTOR, NEED TO ADJUST QUESTION

Post-Quiz – Part 3

Explain:

1. how the following scales aid in measuring TBI recovery:
 - a. **Disorders of Consciousness Scale (DOCS)** REPEATED USE IMPROVED MEDICAL AND REHAB MANAGEMENT DURING COMA AND RECOVERY. DETECTED PREVIOUSLY UNDETECTED SECONDARY MEDICAL COMPLICATION, WHICH WERE SUCCESSFULLY TREATED. pg10
 - b. **Rancho Los Amigos Scale (RLA):** PROVIDES FEEDBACK TO MEDICAL STAFF ON EFFECTIVENESS OF REHAB. REHAB CAN BE IMPROVED IF THE TEAM RESPONDS TO CHANGES IN THE SCALE OVER TIME AND THERAPIES. Pg 14
 - c. **Glasgow Coma Scale (GSC):** USED TO ESTIMATE AND CATEGORIZE OUTCOMES OF TBI ON BASIS OF OVERALL SOCIAL CAPABILITY OR DEPENDENCE ON OTHERS. # COMMUNICATES TO MEDICAL WORKERS 4 POSSIBLE LEVELS FOR SURVIVAL pg12
 - d. **Disability Rating Scale (DRS):** 29 POINT SCALE TO DETERMINE LEVEL OF DISABILITY - COMA TO COMMUNITY pg17
2. **the emotional stages of recovery.** There are 6 stages of emotional recovery. Confusion & agitation, denial, anger and depression, testing phase, uneasy acceptance, and coping pg 18
3. **the family adjustment stages.** 6 stages- shock, begin to recognize severity, start to get annoyed with the survivor, beginning realism, profound sadness, accept that person may never be the same. Pg 19
4. **biological factors in recovery.** Plasticity, new growth, rerouting pg 22
5. **individual factors affecting recovery.** Work ethic, sense of humor, unselfishness, insight, healthy living, co-operation with other members of medical and rehab team, ability to admit to having a brain injury, use of support groups to talk about frustrations, pre-injury health (physical, mental & emotional) pg 23

Learning Outcomes Checklist

Can you:

Identify:

- the basic stages of recovery
- the steps in the rehabilitation continuum
- major assessment tools used to communicate diagnosis & prognosis
- factors which influence recovery

Explain

Factors which influence recovery:

- Plasticity
- New Growth
- Rerouting
- Time
- Healthy Living
- The Team
- The Individual