Therapeutic Management of Disorders of Consciousness: Occupational Therapy Assessment and Treatment

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Objectives

- Differentiate the clinical presentation of patients in coma, vegetative/unresponsiveness wakefulness syndrome and minimally conscious states.
- Determine appropriate standardized behavioral assessments for patients diagnosed with disorders of consciousness.
- Determine appropriate therapeutic interventions for individuals in a vegetative/unresponsiveness wakefulness syndrome and minimally conscious state.
What is consciousness?

• “Awareness of self and the environment.” (2,5)
• Conscious behavior requires adequate arousal and awareness of content. (2)

Disorders of Consciousness (2)

• Results from focal or diffuse brain injuries that cause widespread functional changes.
• Exists on a continuum, in which patients may or not transition sequentially through each state of consciousness.
• Accurate differential diagnosis is essential in clinical management, treatment approaches and functional outcomes.

The cost of lifetime care for persons with a prolonged DoC can exceed $1,000,000 (5)
Emergence from a minimally conscious state

Minimally Conscious State (MCS)

Vegetative State (VS)/Unresponsive Wakefulness Syndrome (UWS)

Coma
Coma

“A state of unarousable unresponsiveness, in which the eyes remain continuously closed and there is no understandable response to the environment or intrinsic stimulation.” (2)

The primary feature of coma is a total loss of awareness of self and environment, and the inability to attain arousal spontaneously or by a stimuli. (7)

Usually the result of a severe, diffuse, bi-hemispheric lesions of the brain. (4)

All of the following are present during clinical evaluation:
  - No spontaneous or stimulus-induced eye opening
  - No command following
  - No intelligible speech/vocalization
  - No purposeful movement
  - No defensive movements or capacity to localize noxious stimuli.
Vegetative State (VS)/Unresponsive Wakefulness Syndrome (UWS) (2)

* Reticular system has recovered
  * Intermittent wakefulness. Demonstrates a sleep-wake cycle and periods of spontaneous eye opening.
* Remain unable to interact with the environment
* Do not visually track or follow commands
* No evidence of language or language comprehension
* Make some generalized responses and demonstrate reflexive behaviors
Minimally Consciousness State (MCS)

“...A state of severely altered consciousness characterized by limited environmental or self awareness.” (7)

Make more localized, inconsistent, but reproducible responses to stimulation(2)

The diagnosis of MCS requires clear evidence of one or more of the following behaviors:

- Simple command following
- Gestured or verbal yes/no response
- Intelligible verbalization
- Movements or behaviors that occur in relation to environmental stimuli and are not attributable to reflexive activity. (2)
Emergence from MCS (2)

- Occurs when there is a re-emergence of a functional communication system or demonstration of functional object use.
- Various communication systems, utilizing objects that are familiar to the patient.
## VS/UWS vs. MCS

### VS/UWS
- Eye opening
- Sleep wake cycle
- No visual tracking
- No object recognition
- No command following
- No communication
- No contingent emotion

### MCS
- Eye opening
- Sleep wake cycle
- Visual tracking seen often
- Inconsistent object recognition
- Inconsistent command following
- Inconsistent communication
- Inconsistent contingent emotion
Fig. 1. Behavioral observation assesses two dimensions of consciousness: arousal and awareness. In brain death and coma, both dimensions are absent. In the vegetative state, arousal level is relatively preserved in the absence of signs of awareness. In the minimally conscious state, both dimensions are present although behavioral signs of awareness often fluctuate (Giacino et. al., 2009).
Therapeutic Assessment
Individualized assessment of patients in VS and MCS

- How do these patients differ from a “traditional assessment”?
- Why is appropriate assessment so important?
  - 40% of patients assessed and noted to be in a VS/UWS are misdiagnosed (7)
- Behavioral observation remains important for practitioners to detect signs of consciousness in severe TBI (3)
Assessment: Critical Thinking

How would you assess the following for a patient who is unable to follow one step commands?

- Vision
- Active ROM
- Motor planning
- Coordination
- Sensation
Individualized Quantitative Behavioral Assessment (2)

- Where do you start?
- All patients have strengths!
- Observation
- Become comfortable with silence
- Arousal level should be maximized with environmental modifications and sensory stimulation.
  - Deep pressure to the face, neck, upper and lower extremities, sternal rubbing.
- Finding movements that can be transferred to a functional communication system
Command following trials:

- Should incorporate behaviors that are **within the patient’s physical capacity**. Avoid potential for reflexive behaviors.
- Trial broad range of commands that require an auditory, visual, motor, or object related response.
- How is your patient positioned?
- Use a **systematic approach** and **quantitative data collection**
  - How often do you provide cues, what type of cue have you provided, how many times does the client respond, does the patient response better in a certain position, etc.
- Give adequate response time.
Command Following Trials (1)

- **Object related movements:**
  - Look at the (object #1), Look at the (object #2).
  - Take the (object #1), Take the object (#2).
  - Kick the (object #1), Kick the (object #2).

- **Non-object related movements:**
  - Look up, look down, touch your nose, move your (body part), stick out your tongue, open/close mouth, say “ah”.
Critical Thinking

- Why is my patient not responding?
  - Vision
  - Vocalization
  - UE/LE motor movement
Formal Standardized Assessment

- Glasgow Coma Scale (GCS)
- Coma Recovery Scale-Revised (CRS-R)
GCS (11)

- One of the most common scales used to rate disorders of consciousness.
- Characterizes the patient’s best visual, verbal and motor responses at a point in time.
- Completed by first responders only.
- Must be completed within 48 hours of initial injury.
- Formalizes the severity of TBI:
  - 13-15: Mild TBI
  - 9-12: Moderate TBI
  - 3-8: Severe TBI
**GCS**

- **Eye opening**
  - Spontaneous = 4
  - To speech = 3
  - To painful stimulation = 2
  - No response = 1

- **Motor response**
  - Follows commands = 6
  - Makes localizing movements to pain = 5
  - Makes withdrawal movements to pain = 4
  - Flexor (decorticate) posturing to pain = 3
  - Extensor (decerebrate) posturing to pain = 2
  - No response = 1

- **Verbal response**
  - Oriented to person, place, and date = 5
  - Converses but is disoriented = 4
  - Says inappropriate words = 3
  - Says incomprehensible sounds = 2
  - No response = 1

https://www.glasgowcomascale.org
Coma Recovery Scale Revised
CRS-R (1)

- Single assessment supported in TBI research with minor reservations
- Standardized assessment utilized to determine a state of consciousness.
- There are 6 subscales addressing auditory, visual, motor, oromotor/verbal, communication, and arousal functions.
- The lowest item on each subscale represents a reflexive activity and the highest represents cognitively mediated behaviors.
Coma Recovery Scale – Revised ©2004
Record Sheet

This form should only be used in conjunction with the CRS-R Administration and Scoring Manual which defines guidelines for standardized application of the scale

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**AUDITORY FUNCTIONS**
- 4 Consistent Movement to Command *
- 3 Reproducible Movement to Command *
- 2 Localization to Sound
- 1 Auditory Startle
- 0 None

**VISUAL FUNCTIONS**
- 5 Object Recognition*
- 4 Object Localization: Reaching*
- 3 Visual Pursuit *
- 2 Fixation*
- 1 Visual Startle
- 0 None

**MOTOR FUNCTIONS**
- 6 Functional Object Use**
- 5 Automatic Motor Response*
- 4 Object Manipulation*
- 3 Localization to Noxious Stimulation*
- 2 Flexion Withdrawal
- 1 Abnormal Posturing
- 0 None/Flaccid

**OMOTOR/ VERBAL FUNCTIONS**
- 3 Intelligible Verbalization*
- 2 Vocalization / Oral Movement
- 1 Oral Reflexive Movement
- 0 None

**COMMUNICATION SCALE**
- 2 Functional: Accurate**
- 1 Non-functional: Intentional*
- 0 None

**AROUSAL SCALE**
- 3 Attention
- 2 Eye opening without stimulation
- 1 Eye opening with stimulation
- 0 no arousal response

**TOTAL SCORE**
Denotes emergence from MCS**
Denotes MCS*
Updated Guidelines

History
- Goal of the new recommendations is to update the 1995 American Academy of Neurology practice parameter on the persistent vegetative state and the 2002 case definition on MCS and provide care recommendations for patients with prolonged DoC (6).

Prolonged DoC is an individual within coma, VS/UWS or MCS > 28 days (6).

13 recommendations (7).
- 371 rated articles
- Graded the quality of the studies
- Rated the level of obligation
1. “Clinicians should refer patients with DoC who have achieved medical stability to settings staffed by multidisciplinary rehabilitation teams with specialized training to optimize diagnostic evaluation, prognostication, and subsequent management, including effective medical monitoring and rehabilitative care.” (Level B).

2a. “Clinicians should use standardized neurobehavioral assessment measures that have been shown to be valid and reliable (such as those recommended by the ACRM) to improve diagnostic accuracy for the purpose intended” (Level B).
2b. "To reduce diagnostic error in individuals with prolonged DoC after brain injury, serial standardized neurobehavioral assessments should be performed with the interval of reassessment determined by individual clinical circumstances (Level B)."

2c. "Clinicians should attempt to increase arousal before performing evaluations to assess level of consciousness anytime diminished arousal is observed or suspected.” (Level B).

2d. “Clinicians should identify and treat conditions that may confound accurate and diagnosis of DoC prior to establishing a final diagnosis.” (Level B).
4. “Clinicians caring for patients with prolonged DoC should perform serial standardized behavioral evaluation to identify trends in the trajectory of recovery that are important for establishing prognosis.” (Level B).

6. ”Non-traumatic, postanoxic VS/UWS: Clinicians should perform the CRS-R (Level B) (and may assess SEPs (Level C based on feasibility) ) to assist in prognostication regarding recovery of consciousness at 24 months for patients in nontraumatic postanoxic VS/UWS.
Therapeutic Interventions
Therapeutic Interventions (2)

- Ongoing assessment
- Establish level of consciousness
- PROM, splinting, casting
- Tone management
- Seating and positioning
- Monitoring of vitals and performance in various positions
- Family education
- Increasing tolerance to positions out of bed and upright/out of bed schedule
- Decreasing burden of care
- Functional communication
- Establish routine
- Establish an appropriate out of bed schedule
- ADL performance: bringing a wash cloth to face, holding a toothbrush, hand over hand assistance, keeping tasks in context, use familiar objects
Recommendations Related to Treatment (7)

- 12. “Clinicians should be vigilant to the medical complications that commonly occur during the first few months after injury among patients with DoC and, thus should utilize a systematic assessment approach to facilitate prevention, early detection, and treatment.” (Level B).

- 13. “Clinicians should assess individuals with a DoC for evidence of pain or suffering and should treat when there is reasonable cause to suspect that the patient is experiencing pain, regardless of level of consciousness.” (Level B).
14. "Clinicians caring for patients with traumatic VS/UWS or MCS who are between 4 and 16 weeks post injury should prescribe amantadine 100-200 mg twice daily to hasten functional recovery and reduce degree of disability in the early stages of recovery after determining there are no medical contraindications or other case-specific risks for use." (Level B).

15. “Clinicians should counsel families about the limitations of existing evidence concerning treatment effectiveness and the potential risks and harms associated with the interventions that lack evidentiary support.” (Level B).
Positioning
Determine patient’s strengths

Find a consistent motor movement to command

Establish a functional communication system
Prognosis
3. “When discussing prognosis with caregivers of patients with a DoC during the first 28 days post injury, clinicians must avoid statements that suggest these patients have a universally poor diagnosis.” (Level A).

7. Given the frequency of recovery of consciousness after 3 months in patients in non-traumatic VS/UWS, and after 12 months in patients with traumatic VS/UWS, use of the term permanent vegetative state should be discontinued. After these time points, the term chronic vegetative state (UWS) should be applied, accompanied by the duration of the VS/UWS. (Level B).
9. “In patients with a prolonged DoC, once a prognosis has been established that indicates a likelihood of severe long-term disability, clinicians must counsel the family members to seek assistance in establishing goals of care and completing state-specific forms regarding medical decision making, if not already available, applying for disability benefits, and starting estate, caregiver, and long-term care planning. (Level A).

11. ”Clinicians must identify patient and family preferences early and throughout the provision of care to help guide the decision-making process with prolonged DoC.” (Level A).
Prognostic Factors for Survival and Recovery (10)

- Overall life expectancy is shortened in the VS vs. MCS
- Age
- Co-morbidities
- Years of education
- Socio-economic status
- History of psychiatric disorders and substance abuse
- Type of injury
  - Better outcomes for traumatic vs. anoxic or vascular events
- There does not appear to be any definitive temporal cutoff in which consciousness cannot return.

Few studies have assessed the long-term functional outcomes of patients with DoC.

Methods: Participants were inpatient rehab admissions with no evidence of command following prior to admission.

Procedures: Trained research assistants collected information, specifically DRS motor score at time of admission and time to follow commands.
Caring for yourself while taking care of others

- Use your supports both inside and outside of work
- Understand the difficult time families are going through
- Know that at the end of a course of care you TRULY gave the best care for your patient
- Have something to look forward to each day after work

For further questions please e-mail wrightan@einstein.edu
References