

# DISORDERS OF CONSCIOUSNESS: A MULTIDISCIPLINARY TREATMENT APPROACH

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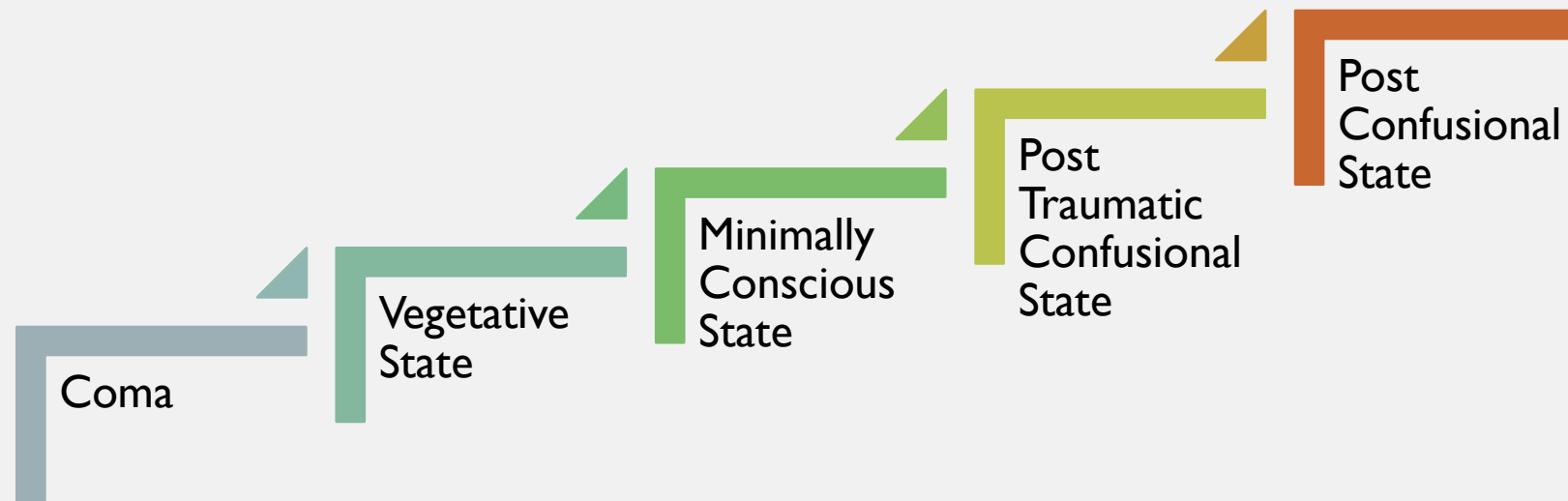
# DISCLOSURE STATEMENT

- Employee of Spaulding Rehabilitation Hospital

# OBJECTIVES

- Provide an overview of Disorders of Consciousness (DOC)
- Review assessment tools utilized with the DOC population
- Discuss the benefits of:
  - A multidisciplinary team approach
  - The development of specialized protocols
- Discussion/Questions

# LEVELS OF CONSCIOUSNESS





# COMA

- No eye opening or sleep-wake cycles
- Cannot be aroused even with stimulation
- No *purposeful* responses
- May have *reflexive* responses

# VEGETATIVE STATE

- Sleep-wake cycle
  - Eye opening can be spontaneous or stimulus driven
- Motor function
  - Postures or withdraws from noxious stimulation
- Auditory function
  - Startle or brief localization to sound
- Visual function
  - Startle or brief fixation
- Subcortical responses

# MINIMALLY CONSCIOUS STATE

- “Minimal but definite behavioral evidence of self or environmental awareness” (*Giacino, et al., Neurology, 2002*)

# MINIMALLY CONSCIOUS STATE

- Motor Function
  - Localizes to noxious stimulation
  - Reaches for objects
  - Holds an object in a manner that accommodates for shape and size
  - Automatic motor responses are observed (e.g. scratching)



# MINIMALLY CONSCIOUS STATE

- Visual Function
  - Sustained fixation
  - Pursuit
- Auditory function
  - Localizes to sound
  - Inconsistent command following
- Communication
  - Inconsistent but intelligible verbalizations or gestures

MINIMALLY CONSCIOUS STATE

Consistency

Complexity

COMPLEX



SIMPLE







# EMERGENCE FROM MCS

- Either:
  - Functional object use
  - Consistent and accurate yes/no responses



# CHANGES IN TERMINOLOGY

- Unresponsive wakefulness vs. vegetative state
- MCS Minus vs. MCS Plus

# POST-TRAUMATIC CONFUSIONAL STATE

- Cognitive Impairment
- Disorientation\*\*
- Agitation
- Fluctuation of symptoms
- Sleep disturbance
- Decreased daytime arousal
- Psychotic type symptoms





# POST-CONFUSIONAL STATE

- $\geq 4$  symptoms of confusion are considered in PTCS
- Exception  $\geq 3$  symptoms if one of the symptoms is disorientation

# SRH DOC PROGRAM OVERVIEW

- 8 week length of stay
- Sufficient medical and neurological stability
- Unable to follow commands consistently, communicate reliably or perform basic self-care activities

# SRH DOC PROGRAM OVERVIEW

- Patient-centered
- Multidisciplinary
- Systematic
- Evidence-based

	<b>LEVEL I</b> <b>Prior to Recovery of</b> <b>Consciousness</b>	<b>LEVEL II</b> <b>Prior to Recovery of</b> <b>Functional Communication</b>	<b>LEVEL III</b> <b>Prior to Recovery of</b> <b>Orientation</b>
<b>LOCATION</b>	Spaulding Hospital Cambridge	Spaulding Rehabilitation Hospital- Boston	Spaulding Rehabilitation Hospital- Boston
<b>CLINICAL STATUS</b>	<p>Level of function (LOF) consistent with coma or vegetative state:</p> <ul style="list-style-type: none"> <li>• Unarousable/Fluctuating Arousal</li> <li>• No command-following</li> <li>• No purposeful movement</li> <li>• No communication ability</li> <li>• Fully dependent for basic care</li> </ul>	<p>LOF consistent with minimally conscious state:</p> <ul style="list-style-type: none"> <li>• Normal/Fluctuating arousal/attention</li> <li>• Inconsistent command following</li> <li>• Automatic/purposeful motor behavior</li> <li>• Unreliable communication</li> <li>• Mod-max assist for basic care</li> </ul>	<p>LOF consistent with acute confusional state:</p> <ul style="list-style-type: none"> <li>• Alert/distractible</li> <li>• Sleep disturbance</li> <li>• Confusion</li> <li>• Impulsive/agitated behavior</li> <li>• Reliable communication</li> <li>• Min-mod assist for basic care</li> </ul>
<b>ASSESSMENT METHODS</b>	Coma Recovery Scale- Revised (CRS-R),Arousal Monitoring Protocol	CRS-R, Individualized Quantitative Behavioral Assessment (IQBA),	Confusion Assessment Protocol (CAP), Functional Limb Movement Protocol
<b>TREATMENT INTERVENTIONS</b>	Medication Trials, CRS-R Arousal Facilitation Protocol, CRS-R-Guided Sensory Modulation	Behavioral Consistency-Enhancing Medication Trials, Augmentative Communication Training, Environmental Control Training	Cognition-Enhancing Medication Trials, Environmental Regulation, Response-Contingent Sensory Feedback Training

# SRH DOC PROGRAM COMPONENTS

- CareMap
- Core measures
- Neurobehavioral clinic & follow-up
- Specialized protocols and individualized quantitative behavioral assessments (IQBA's)
- Family team meetings

		Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8
INTERDISCIPLINARY	ASSESSMENT	<input type="checkbox"/> Initial Team Assessment (including Core Assessment Measures) <input type="checkbox"/> Family interview w/ attending MD, staff RN, CM, SW to obtain history	<input type="checkbox"/> Complete Team Assessment <input type="checkbox"/> Core Assessment Measures Administered <input type="checkbox"/> <b>Neurobeh. Clinic Visit</b> <input type="checkbox"/> <b>Initial Clinical Team Meeting</b>	<input type="checkbox"/> Core Assessment Measures Administered <input type="checkbox"/> Specialized Assessments	<input type="checkbox"/> Core Assessment Measures Administered <input type="checkbox"/> Specialized Assessments	<input type="checkbox"/> Core Assessment Measures Administered <input type="checkbox"/> Specialized Assessments <input type="checkbox"/> <b>Follow up clinical team meeting</b>	<input type="checkbox"/> Core Assessment Measures Administered <input type="checkbox"/> Specialized Assessments	<input type="checkbox"/> Core Assessment Measures Administered <input type="checkbox"/> Specialized Assessments	<input type="checkbox"/> Core Assessment Measures Administered <input type="checkbox"/> Specialized Assessments
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	FAMILY EDUCATION	<input type="checkbox"/> Family Orientation Meeting with CM, nurse manager and program director <input type="checkbox"/> Meeting with outreach coordinator	<input type="checkbox"/> <b>Initial Family Team Meeting</b>	<input type="checkbox"/> Family Ed Seminar	<input type="checkbox"/> Family Ed Seminar	<input type="checkbox"/> Family Ed Seminar	<input type="checkbox"/> Family Ed Seminar <input type="checkbox"/> <b>Follow-up Family Team Meeting</b>	<input type="checkbox"/> Family Ed Seminar	<input type="checkbox"/> Family Ed Seminar

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## CORE MEASURES

VS & MCS	DISCIPLINE	FREQUENCY
Coma Recovery Scale – Revised (CRS-R)	PT, OT, SLP	At least 2x/wk
Modified Ashworth Scale (MAS)	PT	1x/week
Limb Movement Protocol	OT	1x/week
Functional Communication Measures (FCM)	SLP	Admission, 4 weeks, 8 weeks
Medical Complications Checklist	MD	1x/week
Disability Rating Scale (DRS)	Interns	1x/week



## CORE MEASURES

PTCS	DISCIPLINE	FREQUENCY
Confusion Assessment Protocol (CAP)	SLP & Nursing	1x/week
Agitated Behavior Scale (ABS)	SLP, OT, PT and Nursing	Variable based on need, up to every therapy session and nursing shift
Modified Ashworth Scale	PT	1x/week
Limb Movement Protocol	OT	1x/week
Functional Communication Measures	SLP	Admission, 4 weeks, 8 weeks
Medical Complications Checklist	MD	1x/week
Disability Rating Scale	Interns	1x/week
Word Fluency	SLP	1x/week

# COMA RECOVERY SCALE-REVISED

- Auditory Function
- Visual Function
- Motor Function
- Oromotor/Verbal Function
- Communication
- Arousal

COMA  
RECOVERY  
SCALE-  
REVISED

**AUDITORY FUNCTION SCALE**

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

**VISUAL FUNCTION SCALE**

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

**MOTOR FUNCTION SCALE**

- 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

**OROMOTOR/VERBAL FUNCTION SCALE**

- 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 w/o Stimulation
- 1 - Eye Opening with Stimulation
- 0 - Unarousable

**TOTAL SCORE**

# CRS SIGNIFICANCE

- Crucial for:
  - Goal setting
  - Prognosis
  - Ensuring team is on the same page regarding behaviors present

# MODIFIED ASHWORTH SCALE

- Measures spasticity in patients with lesions of the Central Nervous System

## Score

- 0** (0) No increase in muscle tone
- 1** (1) Slight increase in muscle tone, manifested by a catch and release or by minimal resistance at the end of the range of motion when the affected part(s) is moved in flexion or extension
- 1+** (2) Slight increase in muscle tone, manifested by a catch, followed by minimal resistance throughout the remainder (less than half) of the ROM (range of movement)
- 2** (3) More marked increase in muscle tone through most of the ROM, but affected part(s) easily moved
- 3** (4) Considerable increase in muscle tone passive, movement difficult
- 4** (5) Affected part(s) rigid in flexion or extension

# MODIFIED ASHWORTH SIGNIFICANCE

- Active movement vs. tone?
- Is the patient physically capable of completing an action?
- What interventions are necessary?
  - Range of motion
  - Casting/splinting
  - Botox or phenol injections
  - Oral Baclofen

# LIMB MOVEMENT PROTOCOL

- Assessment tool utilized to evaluate functional object use with upper extremities

# LIMB MOVEMENT PROTOCOL

## Spaulding Rehabilitation Hospital Limb Movement Scoring Sheet

Name: \_\_\_\_\_ Hand Dominance: \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_

Directions: For each command presented, check boxes that characterize the nature of the patient's motor response. Score 3 trials for each command.

### Response Characteristics

Command	Full Execution Correct Movement 3	Partial Execution Correct Movement 2	Incorrect Movement 1	Perseverative ( <input type="checkbox"/> )	No Response 0	Not Assessed 00	Comments	Total for each of the 8 items (x/9)
Touch my hand								
Touch your nose								
Take the ball								
Comb your hair								
Brush teeth								
Drink from cup								
Shake hands								
Wave goodbye								

Physical/Visual Modifications: \_\_\_\_\_

Total ( \_\_/72)



# LIMB MOVEMENT SIGNIFICANCE

- Assesses instrumental praxis and social gestures
- Helps determine which actions to utilize within protocols
- Looks at command following and functional object use in more detail than the CRS-R

# FUNCTIONAL COMMUNICATION MEASURES (FCM'S)

- Developed by ASHA
- Must complete online training
- Ranges from level 1 (least functional) to 7 (most functional)
- Only completed for goal areas
- 15-items: Alaryngeal Communication, Attention, Augmentative-Alternative Communication, Fluency, Memory, Motor Speech, Pragmatics, Problem Solving, Reading, Spoken Language Comprehension, Spoken Language Expression, Swallowing, Voice, Voice Following Tracheostomy, Writing

# FCM'S

55						
56	<b>Functional Communication Measures</b>					
57	Administered?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
58	Attention	1	1	1	2	
59	Spoken Language Comprehension	1	1	1	2	
60	Spoken Language Expression					
61	Augmentative Alt Communication					
62	Memory					
63	Motor Speech (if verbal)					
64	Problem Solving					
65	Swallowing	1	1	1	2	
66						

# FCM SIGNIFICANCE

- Allows progress to be measured as the patient transitions between levels of consciousness/abilities

# MEDICAL COMPLICATIONS CHECKLIST

70	Medical Complications						
71	Administered?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
72	Hypertonia/spasticity	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
73	Agitation/aggression	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
74	Urinary Tract Infection	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
75	Insomina/sleep disturbance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
76	Motor restlessness/hyperkinesia	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
77	Vomiting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
78	Abnormal laboratory finding	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
79	Other GI problem	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
80	Pneumonia	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
81	Autonomic "storm"	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
82	Skin rash	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
83	Hydrocephalus	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
84	Tachycardia	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
85	Diarrhea	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
86	Upper respiratory tract infection	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
87							
88							

## MEDICAL COMPLICATIONS CHECKLIST

- Inventory of complications often seen in brain injury
- Track items that may have an impact on the patient's overall profile



# DISABILITY RATING SCALE

- Eye opening
- Communication ability
- Motor response
- Feeding (cognitive ability only)
- Toileting (cognitive ability only)
- Grooming (cognitive ability only)
- Level of functioning (physical, mental, emotional, social)
- Employability (as a worker, homemaker, student)



# DRS SIGNIFICANCE

- Track progress over time



# CONFUSION ASSESSMENT PROTOCOL

**CAP Scoring Criteria**

Name: \_\_\_\_\_ Date: \_\_\_\_\_

CAP# \_\_\_\_\_

	<u>Correct</u>	<u>Incorrect</u>	<u>CI Score</u>	<u>CAP Score</u>	
TOTART Counting to 20 forward	2	0	_____		
TOTART Counting to 20 backward	4	0	_____		
TOTART Reciting months forward	2	0	_____		
TOTART Reciting months backward	6	0	_____		
CTD Vigilance (hits X 2) - commissions	$\frac{36}{4}$	$\frac{30-35}{2}$	$\frac{\leq 30}{0}$	_____	
CTC Comprehension	$\frac{4}{4}$	$\frac{3}{2}$	$\frac{2, 1, 0}{0}$	_____	
CTD Recognition	$\frac{10}{6}$	$\frac{9}{4}$	$\frac{8-7}{2}$	$\frac{6-0}{0}$	_____
TOTAL SCORE			_____		
Cognitive Impairment (Total possible score = 28. Scores $\leq 18$ indicate substantial impairment and count as one symptom of post-traumatic confusion.)				_____	
<b><u>2. Disorientation:</u></b> (Measured with the GOAT. GOAT error scores $> 24$ indicate disorientation and count as one symptom of post-traumatic confusion.)				_____	
<b><u>3. Agitation:</u></b> (Measured with the ABS. ABS scores $> 17$ indicate increased restlessness and count as one symptom of post-traumatic confusion.)				_____	
<b><u>4. Fluctuation of Symptoms (DRS-R):</u></b> (Clinician Rated Item 1. Scores of 1 or 2 indicate significant fluctuation and count as one symptom of post-traumatic confusion.)				_____	
<b><u>5. Sleep Disturbance:</u></b> (Clinician Rated Item 2 as informed by sleep charts and other information. Scores of 2 or 3 indicate significant sleep disturbance and count as one symptom of post-traumatic confusion.)				_____	
<b><u>6. Decreased Daytime Arousal:</u></b> (Clinician Rated Item 3. Scores of 2 or 3 indicate significantly decreased daytime arousal and count as one symptom of post-traumatic confusion.)				_____	
<b><u>7. Psychotic Type Symptoms (DRS-R):</u></b> (Clinician Rated Items 4, 5, and 6. Scores of 1, 2, or 3 on item 4 or scores of 1, 2, or 3 on item 5, or scores of 2 or 3 on item 6 indicate psychotic type symptoms and count as one symptom of post-traumatic confusion.)				_____	
CAP TOTAL SCORE (Patients showing 4 or more symptoms are confused and patients showing 3 or more symptoms are confused if 1 of the symptoms is disorientation.)				_____	

Circle one:            Non-confused            Confused

# AGITATED BEHAVIOR SCALE

## AGITATED BEHAVIOR SCALE

Patient \_\_\_\_\_

Period of Observation:

Observ. Environ. \_\_\_\_\_

From: \_\_\_\_\_ a.m. \_\_/ \_\_/

Rater/Disc. \_\_\_\_\_

To: \_\_\_\_\_ p.m. \_\_/ \_\_/

At the end of the observation period indicate whether each behavior was present and, if so, to what degree: slight, moderate or extreme. The degree can be based on either the frequency of the behavior or the severity of a given incident. Use the following numerical value of every behavior listed. DO NOT LEAVE BLANKS.

- 1= absent
- 2= present to a slight degree
- 3= present to a moderate degree
- 4= present to an extreme degree

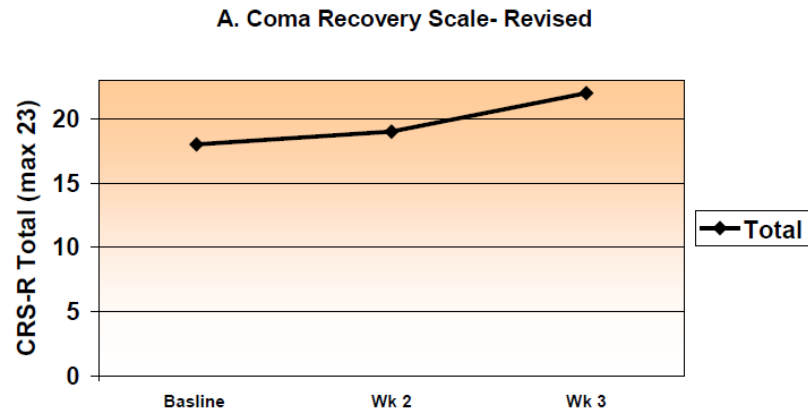
A.M.                      P.M.

- |     |     |  |
|-----|-----|--|
| ___ | ___ | 1. Short attention span, easy distractibility, inability to concentrate. |
| ___ | ___ | 2. Impulsive, impatient, low tolerance for pain or frustration.          |
| ___ | ___ | 3. Uncooperative, resistant to care, demanding.                          |
| ___ | ___ | 4. Violent and/or threatening violence toward people or property.        |
| ___ | ___ | 5. Explosive and/or unpredictable anger.                                 |
| ___ | ___ | 6. Rocking, rubbing, moaning or other self-stimulating behavior.         |
| ___ | ___ | 7. Pulling at tubes, restraints, etc.                                    |
| ___ | ___ | 8. Wandering from treatment areas.                                       |
| ___ | ___ | 9. Restlessness, pacing, excessive movement.                             |
| ___ | ___ | 10. Repetitive behaviors, motor and/or verbal.                           |
| ___ | ___ | 11. Rapid, loud or excessive talking.                                    |
| ___ | ___ | 12. Sudden changes of mood.  |
| ___ | ___ | 13. Easily initiated or excessive crying and/or laughter.                |
| ___ | ___ | 14. Self-abusiveness, physical and/or verbal.                            |
| ___ | ___ | Total Score(s)   |



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# NEUROBEHAVIORAL CLINIC



- Clinical questions generated by interdisciplinary team ahead of time
- Review of data
- Patient assessment
- Discussion
- Development of specialized protocols and IQBA's



## INDIVIDUALIZED QUANTITATIVE BEHAVIORAL ASSESSMENT PROTOCOLS (IQBA'S)

- Developed based on the individual's abilities and the team's objectives.
- Systematic and involve data collection from all members of the multidisciplinary team.
- Highly dependent on the overall goal for functional communication.
- Allow for evidence based intervention in guiding the treatment plan

# INDIVIDUALIZED QUANTITATIVE BEHAVIORAL ASSESSMENT PROTOCOLS (IQBA'S)

- Examples may include:
  - Visual functions
  - Motor Functions
  - Command-following
  - Communication ability
  - Medication efficacy

**SAMPLE: AROUSAL MONITORING**



## INDIVIDUALIZED QUANTITATIVE BEHAVIORAL ASSESSMENT PROTOCOL: AROUSAL MONITORING

Patient: \_\_\_\_\_ Therapist: \_\_\_\_\_

Date: \_\_\_\_\_ Therapy: \_\_\_\_\_

Time: \_\_\_\_\_ Medication Dose: \_\_\_\_\_

**Procedure:** This protocol is designed to determine whether there is a discernible difference in the frequency of episodes of underarousal before, during and after use of neurostimulant medications. This protocol can also be used to monitor arousal in the absence of neurostimulant medications. Arousal level should be monitored during the first, middle, and last five minutes of each therapy session. Routine therapeutic activities should be conducted during the monitoring intervals, however, the Arousal Facilitation Protocol (AFP) should not be administered during these time periods.

**Operational Definition of Underarousal:** An episode of underarousal begins when contact between the upper and lower eyelids is maintained continuously for longer than 3 seconds and ends when contact is released for longer than 3 seconds.

**Instructions:** During the first, middle and last 5 minutes of the treatment session, observe the status of the eyelids. Any time the eyelids are observed to close for at least 3 seconds, begin timing the length of time they remain closed. Stop timing when the eyelids remain open for at least 3 seconds. Continue recording episodes of sustained eye closure in this manner during the first, middle and last 5 minutes of the session. At the end of each 5 minute interval, record the total length of time the eyelids were closed during that period and enter it in the appropriate time block. Next, record the total length of time the eyes remained closed within and across each 5 minute interval. Finally, place an asterisk in each time block in which there was sustained eyelid closure (ie. > 3 seconds) without loss of behavioral responsiveness. Note the patient's position (e.g. in bed or in chair) for each 5-minute observations window.

	<b>First 5 mins of tx session (0-5 mins)</b>	<b>Middle 5 mins of tx session (25-30 mins)</b>	<b>Last 5 mins of tx session (55-60 mins)</b>	<b>Total duration of eyelid closure</b>
	<b>Duration of eyelid closure</b>	<b>Duration of eyelid closure</b>	<b>Duration of eyelid closure</b>	
<b>Position</b>				
<b>1-60 seconds</b>				
<b>61-120 seconds</b>				
<b>121-180 seconds</b>				
<b>181-240 seconds</b>				
<b>241-300 seconds</b>				
<b>Total duration of eyelid closure</b>				

**SAMPLE: AUDITORY LOCALIZATION**

## INDIVIDUALIZED QUANTITATIVE BEHAVIORAL ASSESSMENT PROTOCOL

### AUDITORY LOCALIZATION

**Patient:**

**Protocol Description:** Remove any obvious auditory and/or visual distracters from the patient's immediate environment. Record pt's positioning (laying in bed, upright in bed, in wheelchair, on tilt table) and position pt's head at midline. Standing out of pt's line of sight, on R or L as indicated, present auditory stimuli for 5 seconds. Allow 5 seconds response time per stimuli and note **first** eye and/or head movement made. Eye/head movement must be enough to clearly determine direction of movement; otherwise, record as No Response. To record a response, circle the direction of movement as indicated in data sheet attached. In the Comments column, record type of response (head movement, eye movement, or both) as well as any relevant behavioral observations.

Please administer one run at the beginning of the therapy hour and a second run at the end.

**Auditory Stimulus:** Clap your hands together while saying: "Look over here, \_\_*(name)*\_\_. Look at me." Present stimulation for 5 seconds per trial.

	<b>LEFT Auditory Stimulus</b>	<b>RIGHT Auditory Stimulus</b>	<b>COMMENTS</b>
	<b>Circle Response</b>	<b>Circle Response</b>	<b>Record Movement</b>
1	---	R (+) / L (-) / NR	
2	---	R (+) / L (-) / NR	
3	L (+) / R (-) / NR	---	
4	L (+) / R (-) / NR	---	
5	---	R (+) / L (-) / NR	
6	L (+) / R (-) / NR	---	
7	L (+) / R (-) / NR	---	
8	---	R (+) / L (-) / NR	
9	L (+) / R (-) / NR	---	
10	---	R (+) / L (-) / NR	
<b>TOTAL</b>	<b>Mvmt LEFT (+): __/5 Mvmt RIGHT (-): __/5 No Response: __/5</b>	<b>Mvmt RIGHT (+): __/5 Mvmt LEFT (-): __/5 No Response: __/5</b>	

**SAMPLE: COMMAND FOLLOWING**

## COMMAND FOLLOWING PROTOCOL

**Objective:** To determine whether \_\_\_\_\_ is capable of upward eye movement to command.

During each therapy session the therapist will monitor upward eye movement under three conditions (i.e., contingent stimulus, alternate stimulus, no stimulus). A tracking sheet will be utilized to gather data and analyze the responses to differentiate reflexive and/or random eye movements from contingent eye movements. Prior to running the protocol, \_\_\_\_\_ should be adequately aroused and positioned to maximize comfort.

**Target behavior: Upward eye movement to command: criteria is met when the sclera of the eye is visible beneath the iris.**

**C1 (contingent stimulus): “Look up at the ceiling.”**

**C2 (alternate stimulus): “Open your mouth.”**

**C3 (no stimulus): Rest**

### **Procedure:**

Administer one cycle of deep pressure stimulation for arousal, if needed.

Administer the three conditions in the order indicated on the tracking sheet.

The patient has 10 seconds to perform the command.

If there is no response within 5 seconds, repeat the command.

Administer each condition approximately 20 seconds apart, unless upward eye gaze from the prior trial persists beyond the 10 second response window. Under these circumstances, the examiner should defer the next trial until 20 seconds have elapsed without upward eye gaze.

*Remember, you are monitoring the target behavior only in all three conditions.*

## EYE GAZE COMMAND FOLLOWING TRACKING SHEET

Pt. Name: \_\_\_\_\_

Therapist: \_\_\_\_\_

Date: \_\_\_\_\_

Time: \_\_\_\_\_

Target behavior: *Upward eye movement to command. Criteria is met when sclera of the eye is visible beneath the iris.*

Trial	Condition	Response
1	1	
2	3	
3	2	
4	3	
5	1	
6	2	
7	1	
8	3	
9	2	

+: Target behavior observed during response window

-: Target behavior not observed during response window

Total "+" for C1: \_\_\_\_\_

Total "+" for C2: \_\_\_\_\_

Total "+" for C3: \_\_\_\_\_



**SAMPLE: YES/NO RESPONSIVENESS  
AND ACCURACY**

**Objective:** To determine response consistency and accuracy for Yes/No questions

## **Procedure**

- Administer one cycle of deep pressure stimulation for arousal, if needed.
- Administer runs of 6 paired yes/no questions within the domains of personal information, orientation information and/or general knowledge.
- Record + or – for whether or not pt provided a response within 10 second period and + or – for whether or not pt's response (if any) was accurate.

	Response?	Accurate?	Comments
<b>Personal Questions:</b>			
Do you live in Boston? (y)			
Are you 44 years old? (n)			
Do you have 4 children? (y)			
Are you 60 years old? (y)			
Do you live in California? (n)			
Do you have 7 children? (n)			
TOTAL:	/ 6	/ 6	
<b>Orientation Questions:</b>			
Are we in an airport now? (n)			
Is the year 2002? (n)			
Are we in a hospital right now? (y)			
Did you have a heart attack? (n)			
Is the year 2011? (y)			
Did you have a fall? (y)			
TOTAL:	/ 6	/ 6	
<b>General Knowledge Questions:</b>			
Is a banana a fruit? (y)			
Do radios have pictures? (n)			
Are there 12 items in a dozen? (y)			
Are glass windows breakable? (y)			
Are mountains small? (n)			
Is ice hot? (n)			
TOTAL:	/ 6	/ 6	

		Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8
INTERDISCIPLINARY	ASSESSMENT	<input type="checkbox"/> Initial Team Assessment (including Core Assessment Measures) <input type="checkbox"/> Family interview w/ attending MD, staff RN, CM, SW to obtain history	<input type="checkbox"/> Complete Team Assessment <input type="checkbox"/> Core Assessment Measures Administered <input type="checkbox"/> <b>Neurobeh. Clinic Visit</b> <input type="checkbox"/> <b>Initial Clinical Team Meeting</b>	<input type="checkbox"/> Core Assessment Measures Administered <input type="checkbox"/> Specialized Assessments	<input type="checkbox"/> Core Assessment Measures Administered <input type="checkbox"/> Specialized Assessments	<input type="checkbox"/> Core Assessment Measures Administered <input type="checkbox"/> Specialized Assessments <input type="checkbox"/> <b>Follow up clinical team meeting</b>	<input type="checkbox"/> Core Assessment Measures Administered <input type="checkbox"/> Specialized Assessments	<input type="checkbox"/> Core Assessment Measures Administered <input type="checkbox"/> Specialized Assessments	<input type="checkbox"/> Core Assessment Measures Administered <input type="checkbox"/> Specialized Assessments
	TREATMENT	<input type="checkbox"/> Initial ITC	<input type="checkbox"/> Implement Initial Treatment Intervention(s) <input type="checkbox"/> ITC	<input type="checkbox"/> Implement Initial Treatment Intervention(s) <input type="checkbox"/> ITC	<input type="checkbox"/> Implement Initial Treatment Intervention(s) <input type="checkbox"/> ITC	<input type="checkbox"/> Implement Revised Treatment Intervention <input type="checkbox"/> ITC	<input type="checkbox"/> Implement Revised Treatment Intervention <input type="checkbox"/> Establish Transition/Discharge Plan (ITC)	<input type="checkbox"/> Implement Revised Treatment Intervention <input type="checkbox"/> Implement Transition/Discharge Plan (ITC)	<input type="checkbox"/> Implement Revised Treatment Intervention <input type="checkbox"/> Final Review of Data Summary/Finalize Transition/Discharge Plan (ITC)
	FAMILY EDUCATION	<input type="checkbox"/> Family Orientation Meeting with CM, nurse manager and program director <input type="checkbox"/> Meeting with outreach coordinator	<input type="checkbox"/> <b>Initial Family Team Meeting</b>	<input type="checkbox"/> Family Ed Seminar	<input type="checkbox"/> Family Ed Seminar	<input type="checkbox"/> Family Ed Seminar	<input type="checkbox"/> Family Ed Seminar <input type="checkbox"/> <b>Follow-up Family Team Meeting</b>	<input type="checkbox"/> Family Ed Seminar	<input type="checkbox"/> Family Ed Seminar

## OTHER INTERVENTIONS

- Positioning
  - Multidisciplinary responsibility
  - Wheelchair/Bed
    - Use of specialty backs, headrests, cushions, tray tables, etc.
    - Use of wedges, splints
- Spasticity management

## OTHER INTERVENTIONS

- Edge of mat sitting
  - Increased arousal? Move patient side to side
- Supported weight-bearing in UE/LE
  - Dependent therapist assisted
- Tilt table
- Standing frame
- Lite-Gait with over-ground harness
  - For emerging patients
  - Allows you to assess spontaneous lower extremity movement

		Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8
INTERDISCIPLINARY	ASSESSMENT	<input type="checkbox"/> Initial Team Assessment (including Core Assessment Measures) <input type="checkbox"/> Family interview w/ attending MD, staff RN, CM, SW to obtain history	<input type="checkbox"/> Complete Team Assessment <input type="checkbox"/> Core Assessment Measures Administered <input type="checkbox"/> <b>Neurobeh. Clinic Visit</b> <input type="checkbox"/> <b>Initial Clinical Team Meeting</b>	<input type="checkbox"/> Core Assessment Measures Administered <input type="checkbox"/> Specialized Assessments	<input type="checkbox"/> Core Assessment Measures Administered <input type="checkbox"/> Specialized Assessments	<input type="checkbox"/> Core Assessment Measures Administered <input type="checkbox"/> Specialized Assessments <input type="checkbox"/> <b>Follow up clinical team meeting</b>	<input type="checkbox"/> Core Assessment Measures Administered <input type="checkbox"/> Specialized Assessments	<input type="checkbox"/> Core Assessment Measures Administered <input type="checkbox"/> Specialized Assessments	<input type="checkbox"/> Core Assessment Measures Administered <input type="checkbox"/> Specialized Assessments
	TREATMENT	<input type="checkbox"/> Initial ITC	<input type="checkbox"/> Implement Initial Treatment Intervention(s) <input type="checkbox"/> ITC	<input type="checkbox"/> Implement Initial Treatment Intervention(s) <input type="checkbox"/> ITC	<input type="checkbox"/> Implement Initial Treatment Intervention(s) <input type="checkbox"/> ITC	<input type="checkbox"/> Implement Revised Treatment Intervention <input type="checkbox"/> ITC	<input type="checkbox"/> Implement Revised Treatment Intervention <input type="checkbox"/> Establish Transition/Discharge Plan (ITC)	<input type="checkbox"/> Implement Revised Treatment Intervention <input type="checkbox"/> Implement Transition/Discharge Plan (ITC)	<input type="checkbox"/> Implement Revised Treatment Intervention <input type="checkbox"/> Final Review of Data Summary/Finalize Transition/Discharge Plan (ITC)
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# IMPORTANCE OF FAMILY ENGAGEMENT

- Source of information
- Subtle differences in interpretation can have significant implications
- Emotional impact of TBI
- Discharge planning



## DISCHARGE CRITERIA

A. If Level III is attained within the 8-week timeframe, the case manager will request authorization for “admission” to the general inpatient ABI Program, pending medical stability.

B. If Level III is not attained within 8 weeks, but there is evidence of significant recovery (i.e. defined as average weekly CRS-R change score  $\geq$  1 point or emergence of at least 1 new feature of MCS [present on at least 3 exams] from week 3 to week 6), the case manager will request an extension (i.e. 4 weeks per request).

C. If Level III is not attained within 8 weeks, and the rate of improvement from week 1 to week 6 is less than 1 point per week (on average), discharge planning activities will be completed in concert with family members between weeks 6 and 8.

\*If pt experiences a complication during the program, the case manager will advocate to extend the stay if the rate of improvement approximates the level noted above.

# SUMMARY

- Medication Adjustments
- Systematic data collection allows for thorough data analysis and guides the POC
- Provides evidence of functional gains/decline
- Advocate for more time from insurance companies
- Facilitate appropriate discharge disposition

# SUMMARY

- Promotes cohesive treatment approach for all members of the multidisciplinary team
- Consistent approach to communication with patient
- Thorough understanding of patient deficits and most effective treatment approach
- Objective and concrete information to guide treatment

# SUMMARY

- Facilitates an evidenced-based environment
- Evidence within the patient case
- Evidence to support rehab for this patient population
- Enhances family experience and education
- Concrete information to help families understand the goals of treatment and plan of care
- Regular meetings enhance their role as members of the team

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DISCUSSION/QUESTIONS

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