Gaining a Greater Understanding of the Management and Treatment of a Patient in a Disorder of Consciousness (DOC).

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Disclosures

• Speaker has no relevant financial or non-financial relationships to disclose.

Objectives

• Recognize the goals of the DOC Program.
• Identify appropriate interventions of this patient population.
• Understand the use of the Coma Recovery Scale-revised for assessment and treatment.
Etiology

- Most common for adolescents and adults
  - Traumatic brain injury (TBI)
  - Hypoxic-ischemic encephalopathy
- Other less common causes
  - Cerebrovascular accident
  - Central nervous system infections
  - Tumors
  - Poisoning
  - Neurodegenerative disease

Pre-Admission Considerations

- Age of patient
- Mechanism of injury
- Time of injury
- Complicating medical issues
- Pre-existing medical history
- Discharge plan

WHAT IS A DISORDER OF CONSCIOUSNESS PROGRAM?
DOC Program

- Integrated program of medical management and therapeutic interventions aimed at a subset of the brain injury population.
- Typically an 8 week program.
- Comprised of specialized assessments and treatment interventions.

Clinical Pathway

- Typical length of stay (LOS)
  - Minimum of 8 weeks
  - Can be variable depending on payer and progress
- Weeks 1, 2, 3
  - Initiate Coma Recovery Scale – revised (CRS-r)
  - Initiate family training/meetings
  - Seating & positioning referral
- Weeks 4, 5, 6 and beyond
  - Durable medical equipment (DME) trialing and finalizing
  - Continued family training (hands-on)
  - Continued special program referrals

Multidisciplinary Team Goals

- Continued medical stability
- Accurately assessing DOC level
- Improved wakefulness and arousal
- Improved orientation and attention
- Compensatory strategies for cognitive and communication deficits
- Spasticity management
- Safety/behavior management
- Caregiver education and training
- Facilitating safe discharge
MAINTAINING MEDICAL STABILITY

Prevention of Secondary Complications

Clinical Presentation

- Varies greatly
- Presentation influenced by:
  - Hypotonicity vs hypertonicity
  - Cardiopulmonary/Orthopedic/Integumentary complications
  - Presence of posturing

Identification & Prevention

- Sympathetic storming
- Infections
  - UTI
  - Pneumonia
- Related to immobility
  - DVT
  - Pressure ulcers
  - Contractures
  - Heterotrophic ossification
  - Posttraumatic hydrocephalus
LIMITING LIKELIHOOD OF ERRORS

ACCURATELY DETERMINING LEVEL OF CONSCIOUSNESS

Errors in Diagnosis

- Can lead to:
  - Poor prognosis - end of life decisions.
  - Reduced access to rehabilitation treatment required.
  - Prolonged treatment when no longer appropriate or indicated.
  - Inappropriate placements in nursing facilities.

Common Assessment Tools

- Coma Recovery Scale – Revised (CRS-r)
  - Used for all DOC patients
  - Completed by PT/OT/ST at admission and on a weekly basis
  - Primary tool for diagnosing, tracking progress and guiding treatments
- Agitated Behavior Scale (ABS)
  - Completed by PT, OT, ST on admission and with changes in behaviors
- Orientation Log (O-Log)
  - Completed by PT or OT once emerged and until post traumatic amnesia has cleared
CRS-r Purpose

- Standardized assessment of behaviors
- Detects subtle changes in neurobehavioral status
- Determines Vegetative, Minimally Conscious and Emerged States
- Promotes inter-rater reliability
- Prognostic
- Monitors rate of recovery
- Facilitates multidisciplinary treatment planning
- Evaluates efficacy of treatment interventions
- Assists therapists with setting appropriate goals

Test Characteristics

- Evaluation of individuals with Rancho levels II-V
- Assesses six areas of function
  - Auditory, Visual, Motor, Oromotor/verbal, Communication, Arousal
- Scored on an ordinal scale
- Hierarchical
  - Lowest item is most reflexive
  - Highest item is cortically-mediated
Prior to Conducting Assessment
• Conduct a 1 minute baseline observation
  • Record resting posture of extremities
  • Eye opening status
  • Presence or absence of spontaneous visual fixation and tracking
  • Observe spontaneous movement
  • Determine level of arousal

Auditory Function
• Consistent Movement to Command
  • Object Related
  • Non-Object Related
  • Localization to Sound
  • Auditory Startle

Visual Function
• Object Recognition*
• Object Localization: Reaching*
• Visual Pursuits*
• Fixation*
• Visual Startle
Motor Function

• Functional Object Use +
• Automatic Motor Response *
• Object Manipulation *
• Flexion Withdrawal
• Abnormal Posturing

Oromotor/Verbal Function

• Intelligible Verbalization*
• Vocalization/Oral Movement
• Oral Reflexive

Communication

• Situational Orientation
  • Functional Accurate +
  • Non-Functional Intentional *
• Identify the most appropriate form of communication as early as possible.
Levels of Consciousness

**Vegetative State (VS)**
- Typically follows coma
- Characterized by:
  - Sleep-wake cycle
  - Spontaneous eye opening
  - Inability to follow commands, communicate or perform purposeful movement
  - Generally unresponsive or responses are reflexive

**Minimally Conscious State (MCS)**
- Inconsistent but clearly recognizable signs of consciousness
- Includes one or more of the following:
  - Simple command following
  - Gestures or verbal yes/no responses
  - Intelligible verbalizations
  - Episodes of appropriate crying, laughter or smiling

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<table>
<thead>
<tr>
<th>Behavior</th>
<th>Coma</th>
<th>VS</th>
<th>MCS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eye Opening</td>
<td>None</td>
<td>Spontaneous</td>
<td>Spontaneous</td>
</tr>
<tr>
<td>Spontaneous Movement</td>
<td>None</td>
<td>Reflexive/Patterned</td>
<td>Automatic/Object Manipulation</td>
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<tr>
<td>Response to Pain</td>
<td>Posturing/None</td>
<td>Posturing/Withdrawal</td>
<td>Localization</td>
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<tr>
<td>Visual Response</td>
<td>None</td>
<td>Startle/Pursuit (rare)</td>
<td>Object Recognition/Pursuit</td>
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<tr>
<td>Affective Response</td>
<td>None</td>
<td>Random</td>
<td>Contingent</td>
</tr>
<tr>
<td>Commands</td>
<td>None</td>
<td>None</td>
<td>Inconsistent</td>
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<tr>
<td>Verbalization</td>
<td>None</td>
<td>Random Vocalization</td>
<td>Intelligible Words</td>
</tr>
<tr>
<td>Communication</td>
<td>None</td>
<td>None</td>
<td>Unreliable</td>
</tr>
</tbody>
</table>
Minimally Conscious State

- Behaviors
  - Emotion in response to the linguistic or visual content of emotional topics.
  - Reach for objects that demonstrate a clear relationship between object location and direction of reach.
  - Pursuit eye movements in response in moving stimuli.
  - Holding objects in a manner that accommodates the size and shape of the object.

Emerged State

- Purposeful interactions with the environment
  - Consistent functional object use
  - Functional and accurate communication
  - No longer requiring interventions based on the CRS-r.
  - Progressing functional mobility and maximizing command following.

Functional Levels of Brain Injury

- Level I: DOC
  - Vegetative and Minimally Conscious State
  - May be medically unstable
- Level II
  - Presence of agitated/restless behaviors requiring 1:1 supervision for safety
  - Requires consistent redirection, environmental modification, cueing/prompting for participation (includes emerged DOC patients)
- Level III
  - Demonstrates goal-directed behaviors
  - Completes tasks with minimal cues and redirection
  - Appropriate in group treatment sessions
Therapeutic Interventions

- Passive Range of Motion
- Upright tolerance
- Positional changes
- Bracing/splinting
- Vision Screen and follow-up interventions based on findings
- Eliciting command following/purposeful movement

Specialty Programs

- Canine Assisted Therapy
- Recreation Therapy
- Multisensory Stimulation
- Art Therapy
- Therapeutic Observation Program
- Brace Clinic

Preparing Patients and Families for Home

FACILITATING SAFE DISCHARGE
Educate, Educate, Educate . . .

• Educate early and often
  • Medical information
  • DME
  • Community resources – financial support
  • Follow-up services
• Provide opportunities for:
  • Hands on training in all areas including nursing
  • Home evaluation and modifications

Benefits of Training

• Shown to reduce
  • Mortality
  • Institutionalizations
  • Re-hospitalization
• Increases
  • Level of comfort
  • Understanding of the patients specific needs
  • Likelihood of returning home!

Summary

• Goal of a DOC program is to improve overall arousal and responsiveness to environment using a multidisciplinary approach.
• Provide therapy 3 hours a day, 5 days a week via traditional therapeutic interventions as well as specialized programs.
• Administer the CRS weekly to track progress and changes and assist in determining the patients state and guide treatment plan.
• Discharge planning is critical and begins on day one and continues throughout the length of stay.
Questions

References


