Beth Israel Lahey Health
Beth Israel Deaconess Medical Center

Implementation of Disorders of Consciousness (DoC) Pilot Program

Shannon Carlson PT, DPT, NCS, Jill LaRoche OT, MS,
Sarah MacKenzieS, CCC-SLP, CBIS

Introduction/Problem

When reviewing cases of patients with severe traumatic brain injuries, the following patterns were observed:

- Goals of Care conversations were occurring early in severe traumatic brain injury cases
- Prognosis was nearly universally described as grim, but no data presented to support prognosis
  - Feedback from patients/families was that this was one of the worst parts of their ICU admission
- Rehab staff had lack of competency and limited training regarding performance of Coma Recovery Scale - revised (CRS-R) impacting reliability
- Lack of knowledge of CRS-R on medical teams

New Practice Guidelines / Recommendations for DoC care were released in August 2018

- "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"
- "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"
- "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 prognosis."

Aim/Goal

To improve interdisciplinary care for patients with severe traumatic brain injuries and ensure care is consistent with most up to date practice guidelines by performing earlier and more frequent CRS-R administrations for prognostication purposes and predicting recovery trajectory for use during goals of care conversations.

The Team

Jaimee Cathers, NP
Shannon Carlson, DPT, NCS
Jill Laroche, OT, MS
Sarah MacKenzie, MS, CCC-SLP, CBIS
Dr. Alexandra Stillman, MD
Dr. Martina Stippler, MD

The Intervention Plan

- Identified key stakeholders within the neurology, neurosurgery, and rehab departments
- Collaborated to create a protocol to identify patients, perform the exam, and document in OMR with use of standardized prognostic statements based on the most current literature
- Educated key stakeholders in both formal and information settings to maximize buy-in

Progress to Date

Created a Protocol to Standardize Care

- Appropriate patient criteria identified for pilot program:
  - Acute severe traumatic brain injuries
  - GCS of </=8
  - Significantly impaired arousal
- Prognostic statements created from most recent literature in collaboration with TBI-specializing neurologist
- Workflow process map established for consistent performance of CRS-R 2x/weekly at differing times of day based on practice guidelines
- OMR macros created for consistent documentation with input from all stakeholders
- Physiatry now consistently consulted for patients on DoC census
- TBI pathway updated to include DoC consults to PT, OT, and SLP earlier in stay
- Evidence based prognostic statements to include in notes to assist in prognostication during GoC discussions
- Created macro for documentation to aid in consistency and ease of reference

Education:

- Created training protocol for more streamlined performance and training of inpatient rehabilitation staff
- Facilitated journal clubs, presentations with neurosurgery, rehabilitation services, trauma services
- Incorporated patient and family feedback to improve ongoing care

For more information, contact:
Shannon Carlson : scarlso4@bidmc.harvard.edu

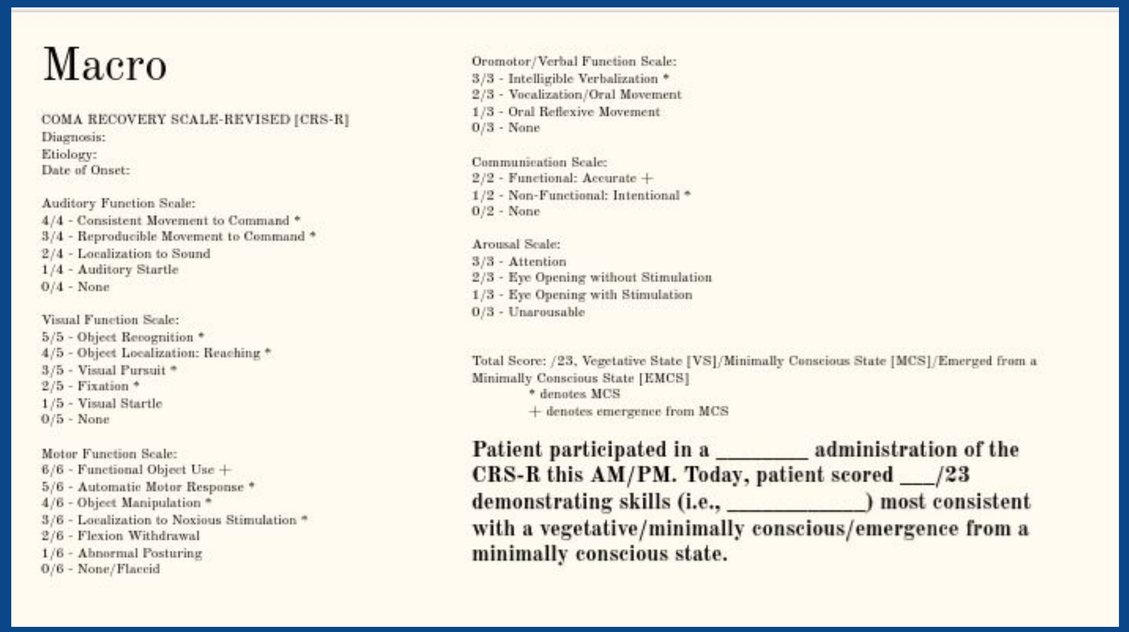
Beth Israel Lahey Health
Beth Israel Deaconess Medical Center

Implementation of Disorders of Consciousness (Doc) Pilot Program

More Results

Results and Progress Indicators

- Earlier initiation of PT/OT/SLP consults for patients with DoC
- Improved communication and teamwork between disciplines and care providers
- Improved appropriateness of discharge environment, including education to case managers regarding specific DoC programs in the nearby rehabs
- In alliance with practice guidelines, established consistent interval assessment of CRS-R throughout inpatient stay (across 18 patients <=3 years)
- Standardized time from admission to first CRS-R administration (<=72 hours)
- Improved reliability and use of data to guide GOC discussions about prognostication and recovery



Macro

COMA RECOVERY SCALE-REVISED [CRS-R]
Diagnosis:
Etiology:
Date of Onset:

Auditory Function Scale:
4/4 - Consistent Movement to Command *
3/4 - Reproducible Movement to Command *
2/4 - Localization to Sound
1/4 - Auditory Startle
0/4 - None

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

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

Oromotor/Verbal Function Scale:
3/3 - Intelligible Verbalization *
2/3 - Vocalization/Oral Movement
1/3 - Oral Reflexive Movement
0/3 - None

Communication Scale:
2/2 - Functional: Accurate +
1/2 - Non-Functional: Intentional *
0/2 - None

Arousal Scale:
3/3 - Attention
2/3 - Eye Opening without Stimulation
1/3 - Eye Opening with Stimulation
0/3 - Unarousable

Total Score: /23, Vegetative State [VS]/Minimally Conscious State [MCS]/Emerged from a Minimally Conscious State [EMCS]
* denotes MCS
+ denotes emergence from MCS

Patient participated in a _____ administration of the CRS-R this AM/PM. Today, patient scored ___/23 demonstrating skills (i.e., _____) most consistent with a vegetative/minimally conscious/emergence from a minimally conscious state.

Lessons Learned

- There is a need for interdisciplinary collaboration for a successful quality improvement project
- A distinct value exists among differing areas of expertise and clinical application
- Ongoing barriers addressed to efficiently and effectively capture all appropriate patients
- Consistent therapy and care team leads to better medical management of patients with DoC
- Consistent and easily accessible documentation results in increased reliable measures for prognostication purposes
- To maintain good communication and adequate education across the care team a considerable amount of time and resources are required
- It is possible to effectively carry out a DoC program in acute care

Next Steps

- Continue to work collaboratively with neurosurgery to identify all appropriate patients who fit inclusion criteria within 72 hours of admission
- Continue to seek out opportunities to provide interdisciplinary education
- Expand work group within rehabilitation department to include more therapists
  - Completion of observations and training modules
- Expand into other diagnostic groups supported by the literature (i.e., anoxic brain injury, stroke)
  - Provide education to primary teams (e.g., general neurology, stroke neurology, cardiology)

References:

- Katz, D. I., Polyak, M., Coughlan, D., Nichols, M., & Roche, A.. (2009). Natural history of recovery from brain injury after prolonged disorders of consciousness: outcome of patients admitted to inpatient rehabilitation with 1-2 year follow-up. Progress in Brain Research, 177, 73-88. https://doi.org/10.1016/S0079-6123(09)17707-5
- Lucca, L.F., et. al. (2019). Outcome prediction in disorders of consciousness: the role of the coma recovery scale revised. BMC Neurology, 19, 68. https://doi.org/10.1186/s12883-019-1293-7
- Whyte, J., et. al. (2013). Functional Outcomes in Traumatic Disorders of Consciousness: 5-Year Outcomes From the National Institute on Disability and Rehabilitation Research Traumatic Brain Injury Model Systems. Archives of Physical Medicine and Rehabilitation, 94, 1855-60.

For more information, contact:

Shannon Carlson : scarlso4@bidmc.harvard.edu