## Outcome Domain:

Recovery of Consciousness and Memory Recovery

## Domain Description and Relevance in TBI:

“Duration of coma, level of consciousness, and rate of recovery contribute significantly to functional outcome and have a key role in treatment and disposition planning.” – Wilde et al. 2010

Table CDE Classification by Type of TBI Study and Relevant Population for Recommended Recovery of Consciousness and Memory Recovery Outcome Measures.

| Outcome Measure Name | Relevant TBI Population | Acute Hospitalized | Moderate/ Severe Rehabilitation | Concussion/ Mild TBI | Epidemiology |
| --- | --- | --- | --- | --- | --- |
| Children's Orientation and Amnesia Test (COAT) | Pediatric  | Supplemental | Supplemental | Supplemental | Supplemental |
| Galveston Orientation and Amnesia Test (GOAT) | Adult and Pediatric  | Supplemental | Supplemental | Supplemental | Supplemental |
| JFK Coma Recovery Scale – Revised (CRS-R) | Adult  | Supplemental | Supplemental | Supplemental | Supplemental |

### References

McCauley SR, Wilde EA, Anderson VA, Bedell G, Beers SR, Campbell TF, Chapman SB, Ewing-Cobbs L, Gerring JP, Gioia GA, Levin HS, Michaud LJ, Prasad MR, Swaine BR, Turkstra LS, Wade SL, Yeates KO. Recommendations for the Use of Common Outcome Measures in Pediatric Traumatic Brain Injury Research. J Neurotrauma. 2012 March; 29: 678-705. PubMed PMID: 21644810.

Wilde EA, Whiteneck GG, Bogner J, Bushnik T, Cifu DX, Dikmen S, French L, Giacino JT, Hart T, Malec JF, Millis SR, Novack TA, Sherer M, Tulsky DS, Vanderploeg RD, von Steinbuechel N. Recommendations for the use of common outcome measures in traumatic brain injury research. Arch Phys Med Rehabil. 2010 Nov;91(11):1650-1660.e17. [DOI: 10.1016/j.apmr.2010.06.033]

## Children’s Orientation and Amnesia Test (COAT)

### DESCRIPTION

The COAT assesses recovery of orientation and memory in children between the ages of 3 and 15 following TBI. Duration of post-traumatic amnesia can be determined by repeating the test until the patient has reached the expected results for persons of the same age without TBI on two consecutive days. The COAT can also be used to determine whether a child has recovered to the point that he or she can take standard psychometric assessments following TBI injury. There are questions on general orientation, memory, and for ages 8-15, temporal orientation.

### PERMISSIBLE VALUES

The maximum raw score is 124. T-scores and percentiles are available.

### PROCEDURE

The test takes 5-10 minutes to administer and should be administered by a health service provider.

### COMMENTS

The COAT is to be used by children with TBI aged 3 to 15 years.

### REFERENCES

Ewing-Cobbs, L., Levin, H., Fletcher, J., Miner, M., and Eisenberg, H. (1990). The children's orientation and amnesia test: Relationship to severity of acute head injury and to recovery of memory. Neurosurgery 27(5), 683-691.

## Galveston Orientation and Amnesia Test (GOAT)

### DESCRIPTION

The GOAT can be administered to assess the duration of post-traumatic amnesia, including ten items on recovery of orientation to person, place, and time. The duration of retrograde and anterograde amnesia can be assessed. It is appropriate for ages 16 and older.

### PERMISSIBLE VALUES

The maximum raw score is 100. T-scores and percentiles are available.

### PROCEDURE

The test takes 5-10 minutes to administer and should be administered by a health service provider.

### COMMENTS

The GOAT is administered to persons 16 and older.

### REFERENCES

Levin, H., O'Donnell, V., and Grossman, R. (1979). The Galveston Orientation and Amnesia Test. A practical scale to assess cognition after head injury. J Nerv Ment Dis 167(11), 675-684.

## JFK Coma Recovery Scale – Revised (CRS-R)

### DESCRIPTION

The CRS-R consists of twenty-three items comprising six hierarchically-arranged subscales addressing auditory, visual, motor, oromotor/verbal, communication and arousal functions. The lowest item on each subscale represents reflexive activity while the highest items represent cognitively-mediated behaviors.

### PERMISSIBLE VALUES

Total score range= 0-23. Diagnoses (Coma, Vegetative State, Minimally Conscious State, Emerged from Minimally Conscious State) are derived directly from subscale scores.

### PROCEDURE

Designed for use by licensed medical and rehabilitation professionals. Can be administered by paraprofessionals and family members with specialized training. Administration procedures are standardized and scoring is based on the presence of operationally-defined behavioral responses. Higher scores are assigned to more complex behaviors. Administration time is 15-30 minutes.

### COMMENTS

Adult and pediatric patients unable to follow commands or communicate reliably (Rancho Los Amigos Scale Levels II-V).

### RATIONALE

Selected from a field of 14 instruments based on criteria originally developed by the American Academy of Neurology and recently modified by the American Congress of Rehabilitation Medicine. The three selection criteria weighted most heavily were, a) acceptable psychometric characteristics, b) published record of clinical utility for diagnosis, prognosis and outcome monitoring and c) ease of use.

### REFERENCES

Giacino JT, Kalmar K, Whyte J. The JFK Coma Recovery Scale- Revised: Measurement Characteristics and Diagnostic Utility. Archives of Physical Medicine and Rehabilitation, 2004;85(12):2020-2029