Table 1 Strategies for optimizing the behavioral assessment of patients with disorders of consciousness

Factors contributing to inaccurate behavioral diagnosis of level of consciousness	Mitigating actions that maximize the chance of detecting signs of consciousness
Failure to ensure adequate arousal prior to beginning assessment	• Increase arousal before performing evaluations (e.g., with the CRS-R Arousal Facilitation Protocol[83]). • Optimize positioning to promote arousal (e.g., wakefulness may improve when sitting up vs. laying down). • Consider the time of day and fatigue from activities preceding the behavioral examination. • Avoid sedating medications, or if unavoidable and provided continuously in an infusion, wean for a sufficient amount of time to promote maximal responsiveness.
Failure to identify medical contributors to low responsiveness	• Identify and treat conditions that may mask evidence of conscious awareness (e.g., infections, metabolic disturbances, seizures, hydrocephalus, chronic subdural hemorrhage, adverse medication effects). • Consider neuromuscular status in choosing commands. Use commands that incorporate motor responses that appear to be within the patient's capabilities, such as those that occur spontaneously, but not repeatedly. • Provide timely medical evaluation in situations of decline or plateau in clinical status.
Lack of consideration of the impact of environmental factors	• Systematically evaluate environmental factors that may influence arousal and cognitive performance and avoid distractions (e.g., turn off music, request that others in the room minimize noise). • Provide adequate lighting. • Remove physical restrictions to movement (e.g., restraints). • Position stimuli to the patient's best advantage (e.g., vertical vs. horizontal placement depending on gaze deviation). • Ensure visual and hearing aids are available if used premorbidly. • Request an interpreter if language barrier is suspected.
Attributing purposeful intent to responses that are reflexive or generalized	• Avoid commands that are difficult to distinguish from reflexive or random behavior (e.g., hand-squeeze and eyelid closure commands are difficult to differentiate from grasp reflex and blinking, respectively). • Attribute purposeful behaviors only to accurate and clearly discernible responses. • Do not confound assessment of command following by cuing with gestures or tactile stimulation. • Failure to respond to a command designed to elicit no behavior (e.g., do not kick your leg) should not be mistaken as command-following given the inability to disambiguate a correct response from no response in this situation. • Use a fixed response window to standardize the allowable period for a response within and across assessments.
Inadequate evaluation of conscious behaviors	• Assess behaviors multiple times to determine consistency and reproducibility of responses. • Use a long enough presentation time and inter-stimulus interval to allow time for the patient to respond but recognize that as the interval between stimulus and response increases, the chance that a spurious response is mistakenly attributed to a stimulus also increases. • Assess behaviors across different domains (e.g., motor, language, visual). • Attempt to elicit responses to commands that recruit different motor pathways—e.g., limb movement (i.e., corticospinal tract) versus head movement (corticobulbar tract). • Avoid unnecessary complexity in command-following trials. Use simple declarative language, one request at a time. • Watch for signs of response fatigue (e.g., responses to the first two, but not the last two of multiple commands). • Consider whether responses may be due to perseveration. • If aphasia is suspected, conduct further language evaluation. • Use test completion codes to document assessment validity.
Over- or under-consideration of family or other's observations of purposeful behavior	• Incorporate the observations of families, nurses, and therapists, who are more familiar or spend more time with the patient, but not base diagnosis solely on the report of other clinicians or family. • Encourage family to video record observed behaviors that may be undetected on formal assessment.
Establishing a diagnosis after a single assessment	• Inconsistency and fluctuations in levels of responsiveness are expected in patients with DoC. • Quick bedside evaluations, such as typical morning rounds, are often not adequate in detecting responses in patients with DoC. • Conduct repeated assessments to establish response consistency, validity of examination findings, and accuracy of the diagnosis.

Abbreviations: CRS-R, Coma Recovery Scale-Revised; DoC, disorders of consciousness.