

# Visual Function in Disorders of Consciousness



Please ensure the patient has adequate arousal (eye opening) and attention prior to providing intervention or assessing level of consciousness. Utilize *Arousal Facilitation Protocol* (see handout) if patient has sustained eye closure or has a change in behavioral responsiveness.

## COMA

When a patient is in a comatose state, he/she does not demonstrate any signs of visual function.

## VEGETATIVE STATE/UNRESPONSIVE WAKEFULNESS

When a patient is in a vegetative state, he/she demonstrates a sleep/wake cycle through eye opening and eye closure. He/she may also demonstrate a **visual startle** (reaction to visual threat) and **brief visual fixation** (shift eye gaze towards visual stimuli <2 seconds). If you consistently notice an absent startle response, consider initiating a visual assessment protocol or discuss completion of visual evoked potentials.



### Possible Responses for Visual Startle:

- Blink
- Eyelid flutter
- Flinch



### Suggested Activities for Eliciting Response:

- Visual threat: moving finger/hand or object quickly towards the eyes from different angles outside of the visual field (ensure not to touch the patient)

### Possible Responses for Brief Visual Fixation:

- Shift in eye gaze towards stimulus item <2 seconds

### Suggested Activities for Eliciting Response:

- Brief presentation of bright or flashing objects in front of patient's face before rapidly moving to a different visual field

## MINIMALLY CONSCIOUS STATE

When a patient is in a minimally conscious state, he/she may demonstrate **sustained visual fixation** and **visual pursuit** (following items in the environment with eyes).



### Possible Responses for Sustained Visual Fixation:

- Shift in eye gaze towards stimulus item >2 seconds

### Suggested Activities for Eliciting Response:

- Brief presentation of bright or flashing objects in front of patient's face before rapidly moving to a different visual field (over)



#### Possible Responses for Visual Pursuit:

- Visual tracking of stimulus item >45 degrees

#### Suggested Activities for Eliciting Response:

- Presentation of a mirror moved slowly between different visual fields (in a “+” or “H” pattern)
- Presentation of salient pictures or muted videos of family and friends moved slowly between different visual fields

## CONSCIOUS STATE

When a patient is fully conscious, he/she may demonstrate consistent **visual pursuit**, **object localization** (ability to locate object in space) and **object recognition** (ability to discriminate between two or more objects). Presence of visual deficits (e.g. hemianopsia, neglect, cortical blindness) may impact performance.



#### Possible Responses for Object Localization:

- Moving towards and/or touching requested object with head or extremity

#### Suggested Activities for Eliciting Response:

- Presentation of object in various positions near head or target extremity (e.g. place a ball to the left of right hand and to the right of right hand in random order and without telling patient where the object is located)

#### Possible Responses for Object Recognition:

- Looking at or touching requested objects given two or more choices

#### Suggested Activities for Eliciting Response:

- Hold up two objects within view and verbally provide labels (e.g. “this is a ball”). Space the objects so that changes in eye gaze or movement of limb/head is discernible. Ask the patient to look at/touch one of the objects.

Bodien YB, Chatelle C, Taubert A, Uchiano S, Giacino JT, Ehrlich-Jones L. Updated Measurement Characteristics and Clinical Utility of the Coma Recovery Scale-Revised Among Individuals With Acquired Brain Injury. *Arch PMR* 2021 102 (169-70)

Giacino, J. T., Fins, J. J., Laureys, S., & Schiff, N. D. (2014). Disorders of consciousness after acquired brain injury: the state of the science. *Nature Reviews Neurology*, 10(2), 99-114. doi:10.1038/nrneurol.2013.279

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