

Auditory 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 auditory function.

VEGETATIVE STATE/UNRESPONSIVE WAKEFULNESS

When a patient is in a vegetative state, he/she may demonstrate an **auditory startle**. This means that he/she has a reaction to **noxious auditory stimulation** (loud and sudden noises) in the environment. If you consistently notice an absent startle response, consider administering a hearing screening or discuss the completion of auditory evoked potentials.



Possible Responses for Auditory Startle:

- Blink
- Startle reaction of the body
- Increased activity/movement



Suggested Activities for Eliciting Response:

- Clap hands loudly near the ear in and out of patient's field of view
- Drop a heavy object near the bedside
- Ring a bell near the ear
- Yell patient's name
- Beat a drum

When a patient is in a vegetative state, he/she may also demonstrate **localization** to sound. *This is a positive indicator of emerging awareness to the environment.*



Possible Responses for Localization to Sound:

- Eye gaze toward sound source
- Head turning (toward or away from sound source)



Suggested Activities for Eliciting Response and Increasing Attention to Sound (recommend starting in a quiet environment):

- Talk to the patient
- Provide frequent, brief reminders about current situation (where he/she is, why he/she is here, date/time, etc.)
- Play music/turn on the TV at specific times during the day. Do not play these items as background noise, as this may distract the patient which may result in a reduced level of responsiveness. Choose specific music or shows that are meaningful to the patient that may elicit a positive or negative response.
- Play recordings of familiar voices/songs
- Call the patient's name with or without clapping
- Whisper close to the patient's ear from behind
- Note any localization responses from activities suggested for startle

(over)

MINIMALLY CONSCIOUS STATE

When a patient is in a minimally conscious state, he/she may demonstrate an inconsistent command following.



Possible Responses for Command Following:

- Completion of requested movement: response rate and accuracy may vary with time of day, medication schedule, positioning, arousal, etc.
- Looking at or touching the requested object upon being given two or more choices (object recognition)



Suggested Activities for Eliciting Response:

- Ask the patient to follow a simple command such as “raise your arm” or “move your leg.” Keep your language simple and allow time in between presentations of each command to give him/her time to process and respond.
- Hold up two objects within view and verbally provide the 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. If you suspect visual deficits, provide the location of the object (e.g. “I have a ball on the left.” or “I have a ball to the left of your head.”).

CONSCIOUS STATE

When a patient is fully conscious, he/she demonstrates consistent, accurate command-following and **functional communication**. Functional communication is typically seen through responses to yes/no questions. Presence of attention deficits, *aphasia* (an impairment in understanding and/or expression of language), or *apraxia* (difficulty with motor planning) may impact performance.



- Please see attached sheet re: How To Establish a Yes/No Communication System

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

Giacino, J & Kalmar, K. (2006). Coma Recovery Scale- Revised. *The Center for Outcome Measurement in Brain Injury*. <http://www.tbims.org/combi/crs>