Coma Recovery Scale

JFK COMA RECOVERY SCALE ©2004										
This form should only be used in association with the "CRS-R ADMINISTRATION AND SCORING GUIDELINES" which provide instructions for standardized administration of the scale.										
Patient:							Date of onset:			
Diagnosis:							Date of assessment:			
Date										
Assessment	1		2		3		4		5	
Auditory function scale	**#**	**TCC**	**#**	**TCC**	**#**	**TCC**	**#**	**TCC**	**#**	**TCC**
4 – Consistent movement to command ■										
3 – Reproducible movement to command ■										
2 – Localization to sound										
1 – Auditory startle										
0 – None										
Visual function scale	**#**	**TCC**	**#**	**TCC**	**#**	**TCC**	**#**	**TCC**	**#**	**TCC**
5 – Object recognition ■										
4 – Object localization: reaching*										
3 – Visual pursuit*										
2 – Fixation*										
1 – Visual Startle										
0 – None										
Motor function scale	**#**	**TCC**	**#**	**TCC**	**#**	**TCC**	**#**	**TCC**	**#**	**TCC**
6 – Functional object use†										
5 – Automatic motor response*										
4 – Object manipulation*										
3 – Localisation to noxious stimulation*										
2 – Flexion withdrawal										
1 – Abnormal posturing										
0 – None										
Oromotor/Verbal function scale	**#**	**TCC**	**#**	**TCC**	**#**	**TCC**	**#**	**TCC**	**#**	**TCC**
3 – Intelligible verbalization ■										
2 – Vocalization/Oral movement										
1 – Oral reflexive movement										
0 – None										
Communication scale	**#**	**TCC**	**#**	**TCC**	**#**	**TCC**	**#**	**TCC**	**#**	**TCC**
2 – Functional: Accurate†										
1 – Non-functional: Intentional ■										
0 – None										
Arousal state	**#**	**TCC**	**#**	**TCC**	**#**	**TCC**	**#**	**TCC**	**#**	**TCC**
3 – Attention										
2 – Eye opening without stimulation										
1 – Eye opening with stimulation										
0 – Unarousable										
Total score										

* - Denotes Minimally Conscious State Minus (MCS-)
■ - Denotes Minimally Conscious State Plus (MCS+)
† - Denotes emergence from Minimally Conscious State (eMCS)
TCC - Test Completion Code

BRAIN STEM REFLEX GRID ©2004						
Administer daily during the acute phase, then weekly						
Mark all that apply:	Date					
	Assessment	1	2	3	4	5
Pupils	Nonreactive: pupils do not constrict in response to light and do not dilate in the dark	☐	☐	☐	☐	☐
Corneal reflex	Absent	☐	☐	☐	☐	☐
	Present in one or both eyes	☐	☐	☐	☐	☐
Eye position and movement	No spontaneous or elicited eye movement	☐	☐	☐	☐	☐
	Skew or conjugate gaze deviation: At rest, one or both eyes are either positioned up or to the left/right, rather than midline	☐	☐	☐	☐	☐
	Dysconjugate gaze: eyes do not move together in the same direction	☐	☐	☐	☐	☐
	Roving: slow, conjugate, lateral, back and forth eye movements	☐	☐	☐	☐	☐
Oculocephalic reflex	None: eyes move in the same direction as head or stay fixed at midline	☐	☐	☐	☐	☐
	Abnormal: response is present but sluggish or unilateral	☐	☐	☐	☐	☐
	Normal: eyes move in the direction opposite the head	☐	☐	☐	☐	☐
Postural responses (indicate limb)	Abnormal extension	☐	☐	☐	☐	☐
	Abnormal flexion	☐	☐	☐	☐	☐
Notes						

AROUSAL FACILITATION PROTOCOL (AFP) ©2004

Guidelines

1. The goal of this intervention is to prolong the length of time the patient maintains arousal (i.e. eye opening)
2. The protocol is administered any time the patient is observed to:
   - Exhibit sustained eyelid closure **AND/OR**
   - Stops following commands for a period of at least one minute
3. Readminister the arousal facilitation protocol when
   - Sustained eye closure re-occurs **OR**
   - Behavioral responsiveness ceases despite sustained eye opening

Interventions

1. Present deep pressure stimulation unilaterally to the face, neck, shoulder, and sternocleidomastoid muscles. The muscle should be firmly grasped at its base between the thumb and forefinger. While squeezing the muscle firmly, it should be "rolled" back and forth through the fingertips three to four times. This procedure should be repeated sequentially working from the facial musculature to the sternocleidomastoid. The examiner should assure that there are no intravenous lines, local injuries (e.g. fractures, contusions, decubiti) or systemic complications (e.g. heterotopic ossification) before administering deep pressure.
2. Administer same on contralateral side

AUDITORY FUNCTION SCALE ©2004

Score	Item	Method	Response
4	**Consistent movement to command**	1.Observe frequency of spontaneous movement for a one minute interval (See **Baseline observation and command following protocol** on page 4)	Clearly discernible and accurate responses occur within 10 seconds on all 4 trials administered. This item is credited only when **all 4 trials of 2 different commands** are passed. When more than one type of command from each category is attempted, scoring is based on successfully completing all 4 trials of any two different commands (e.g., 2 object-related, 2 nonobject related or one of each).
		2. Choose at least 1 object-related and 1 nonobject elated command from the **Command following protocol**. The type of command chosen (eye, limb, oral) should be based on patient's physical capacity and should be of low spontaneous frequency. If at least 2 out of four commands are passed, and time permits, an additional command may be attempted. The command should be repeated once during the 10 second response interval.	
		a. Object-related eye movement commands: Present 2 common objects simultaneously and approximately 16 inches apart within the patient's field of view. Ask the patient to look at the object named (i.e. Look at the [name object]'). Next, reverse the positions of the 2 objects and ask the patient to look at the **same** object again (i.e. 'Look at the [name object]'). Administer two additional trials using the same 2 objects and repeat the above procedure with instruction to look at the **other** object on both trials. Two trials per object should be administered for a total of 4 trials.	
		b. **Object-related limb movement command:** Present 2 common objects simultaneously and approximately 16 inches apart within the patient's field of view and within arm's (or leg's) length and ask the patient to touch the object named with their hand (or foot). Next, reverse the positions of the 2 objects and ask the patient to touch the **same** object again. Administer two additional trials using the same two objects and repeat the above procedure with instruction to touch **the other object on both trials.** Two trials per object should be administered for a total of four trials. This command may also be attempted using head movement.	
		c. **Non-object related commands:** Select at least 1 eye movement, limb movement or oral movement/vocalization command and present it over 4 trials at 15 second intervals. The same command should be used for all 4 trials. Movements that occur between commands (i.e. after the response interval has elapsed) should be noted but not scored.	

Score	Item	Method	Response
3	Reproducible movement to command	Same as the Consistent movement to command item	**3 clearly discernible and accurate** responses occur over the 4 trials on any one of the object or non-object related commands.
2	Localisation to sound	Standing behind the patient and out of view, present an auditory stimulus (e.g. patient's name, voice, noise) from the right side for 5 seconds. Perform a second trial presenting the auditory stimulus from the left side. Repeat above Procedure for a total of 4 trials, 2 on each side. If needed, reorient the head to midline between trials.	Head and/or eyes orient toward the location of the stimulus on **both** trials in at least one direction (ie, twice to the right or twice to the left) within 10 seconds of stimulus presentation. This item is scored when there is clear evidence of head and/or eye movement. It is not dependent on the degree or duration of movement.
1	Auditory startle	Present a loud noise (eg, whistle, clap) directly above the patient's head and out of view. Administer 4 trials.	Eyelid flutter or blink occurs immediately following the stimulus on at least **2** trials. If the eyes are closed, a shoulder shrug or other body startle response can be scored.
0	None	See above	No response to any of the above.

BASELINE OBSERVATION AND COMMAND FOLLOWING PROTOCOL ©2004				
Baseline observations of spontaneous behaviours and resting posture				
Eye-opening				
Visual tracking				
Sticking out tongue				
Opening mouth				
Closing mouth				
Vocalizations (eg. 'ah')				
Resting posture	RUE:		LUE:	
	RLE:		LLE:	
Commands	**Trial 1**	**Trial 2**	**Trial 3**	**Trial 4**
Object related commands: Eye movement				
Look at the (*object #1, object #2*)				
Object related commands: Limb movement				
Take the (*object #1, object #2*)				
Kick the (*object #1, object #2*)				
Non-object related commands: Eye movement				
Look away from me				
Look up (*at ceiling*)				
Look down (*at floor*)				
Non-object related commands: Oral movement/Vocalization				
Stick out your tongue				
Open your mouth				
Close your mouth				
Say 'ah'				
Related commands: Oral movement/Vocalization				
Other command 1:				
Other command 2:				

VISUAL FUNCTION SCALE ©2004			
Score	**Item**	**Method**	**Response**
5	Object recognition	Same as Consistent movement to command on Auditory function scale, Section 2a and b (see page 3)	If the Auditory function score was >2 AND the command used was object-related, score 5 for the Visual Function Scale. If an object-related command was not administered, administer the Object Recognition item. If the Auditory Function score was < 2 AND the command used was object-related, continue with the Object Localization item below.
4	Object localization: Reaching	1. Identify the arm or leg with the greatest range of movement. 2. For upper extremity reaching, select common objects (e.g. comb, toothbrush, etc.) For lower extremity assessment, select a ball suitable for kicking. 3. Present the object approximately 8 inches to the left or right of the limb's resting position. The object should be placed in a position that is not obstructed from view. The patient should be instructed to 'Touch the [name object]' with the appropriate arm or leg. 4. The command may be repeated once within the assessment interval. Do not provide any tactile cues, as these may stimulate random limb movement. 5. Present an object twice to the left of the limb and twice to the right of the limb in random order for a total of 4 trials.	Score the **direction in which the limb first moves** within a 10 second observation period, or score as no movement. The limb does not need to make contact with the object, only to move toward it; and Movement must occur in the correct direction in 3 of the 4 trials administered.
3	Visual pursuit	Hold a mirror 4-6 inches directly in front of the patient's face and verbally encourage the patient to fixate on the mirror. Tilt the mirror slowly 45 degrees to the right and left of the vertical midline and 45 degrees above and below the horizontal midline. Repeat the above procedure so that a total of 2 trials are administered in each hemispace (ie twice up, twice down, twice left and twice right).	Eyes must follow the mirror for 45 degrees **without loss of fixation** on **2** occasions in any direction. *If visual pursuit is not scored, the procedure may be repeated assessing one eye at a time (using an eye patch).*
2	Fixation	Present a brightly colored or illuminated object 6 to 8 inches in front of the patient's face and then rapidly move to upper, lower, right and left visual fields, respectively for a total of 4 trials.	Eyes change from initial fixation point and refixate on the new target location for more than 2 seconds. At least 2 episodes of fixation are required.
1	Visual startle	Present visual threat by passing finger 1 inch in front of patient's eye. Be careful not to touch eyelashes or create a breeze (manually open eyes if necessary). Conduct 4 trials per eye.	Eyelid flutter or blink following presentation of visual threat on at least 2 trials with either eye.
0	None	See above.	No response to any of the above

MOTOR FUNCTION SCALE ©2004			
Score	**Item**	**Method**	**Response**
6	Functional object use	Select 2 common objects (e.g. comb, cup). Place one of the objects in the patient's hand and instruct the patient to 'Show me how to use a [name object]'. Next, place the second object in the patient's hand and restate the same instruction. Repeat the above procedure using the same objects so that a total of 2 trials are administered with each object.	Movements executed are generally compatible with both objects' specific function (e.g. comb is placed on or near the head) on all **4** trials administered. *If the patient is unable to hold the object because of neuromuscular involvement, this should be noted on the record form and the item should not be scored.*
5	Automatic motor response	Observe for automatic motor behaviors patterns such as nose scratching, grasping bedrail, crossing legs, grabbing tubes, that occur spontaneously during the examination. If spontaneous automatic motor behaviors are not observed, present a familiar gesture (e.g. wave) in association with the following series of alternating commands: 1) 'Show me how to wave' (**demonstrate gesture**) 2) 'I'm going to wave again. Do not move at all. Just hold still' (**demonstrate gesture**) 3) 'Show me how to wave' (**demonstrate gesture**) 4) 'I'm going to wave again. Do not move at all. Just hold still' (**demonstrate gesture**) For patients with limited ability to move their limbs, objects associated with oromotor activity may be used (e.g. spoon). Place the object in front of the patient's mouth **without making contact**. Administer the following series of commands: 1) 'Show me how to use [**name object]**' 2) 'I am going to show you [**name object**] again. Do not move at all. Just hold still'. 3) 'Show me how to use [**name object**]' 4) 'I am going to show you [**name object**] again. Do not move at all. Just hold still'.	At least **2** episodes of automatic motor behavior are observed within the session and each episode can be clearly differentiated from a reflexive response. Patient performs the gesture (e.g. waves) or oromotor pattern on *Trials 2 and 4* (regardless of performance on trials 1 and 3).
4	Object manipulation	Place a baseball size ball on the dorsal surface of one of the patient's hands. Roll the ball across the index finger and thumb without touching the undersurface of the hand or fingers. While moving the ball, instruct the patient to "Take the ball". Repeat the above for a total of 4 trials.	The following criteria must be met on **3** of the 4 trials administered: 1.The wrist must rotate and the fingers should extend as the object is moved along the dorsal surface of the hand; and 2. The object must be grasped and held for a minimum of 5 seconds. The object cannot be held by means of a grasp reflex or increased finger flexor tone.

MOTOR FUNCTION SCALE ©2004			
Score	**Item**	**Method**	**Response**
3	Localization to noxious stimulation	Extend all four extremities. Apply pressure to the finger or toe of an extremity (use best extremity on each side of the body) for a minimum of 5 seconds (i.e. squeeze the finger or toe between your thumb and index finger). Administer 2 trials on each side for a total of 4 trials.	The non-stimulated limb must locate and make contact with the stimulated body part at the point of stimulation or with the examiner's hand on at least **2** of the 4 trials.
2	Flexion withdrawal	Extend all 4 extremities. Apply deep pressure to nailbeds of each extremity (i.e. press the ridge of a pencil into the cuticle). Administer 1 trial per extremity.	There is **isolated** flexion withdrawal of at least one limb. The limb must move **away** from the point of stimulation. If quality of response is uncertain, the trial may be repeated.
1	Abnormal posturing	Observe response to above method	Slow, stereotyped flexion **or** extension of the upper and/or lower extremities occurs immediately after the stimulus is applied.
0	None	Observe response to method above	There is no discernible movement following application of noxious stimulation, secondary to hypertonic **or** flaccid muscle tone.

OROMOTOR/VERBAL FUNCTION SCALE ©2004			
Score	**Item**	**Method**	**Response**
3	Intelligible verbalization	1. Tell patient: 'I would like to hear your voice'. This should be followed by an attempt to directly elicit speech using the verbal prompts shown below. At least one prompt should be selected from the Aural Set and at least one from the Visual Set. A maximum of 4 prompts can be administered. 2. A maximum of 3 trials should be administered for each prompt chosen from the Aural and Visual Sets. Prompts should be administered at 10 second intervals. **Aural Set:** a) 'Your name is ___' b) 'You live in ___' c) 'One, two, three, ___' **Visual Set:** a) 'This is a ___' (Hold up a common object in front of the patient's right and then left visual field for 10 seconds). b) 'I holding___ fingers' (Hold up 4 or 5 fingers in front of the right and then left visual field for 10 seconds). c) 'This is a ___' (Point to your nose while positioned at the patient's visual midline).	Each of the following criteria must be met: 1. Each verbalization must consist of at least one consonant-vowel-consonant (CV-C) triad. For example, 'ma' would not be acceptable, but 'mom' would. Make sure objects chosen have a C-V-C sequence; and 2.Two different words must be documented by the examiner to ensure that a repetitive word-like sound is not mistaken for a word. Words need not be appropriate or accurate for the context, but must be fully intelligible; and 3.Words produced by writing or alphabet board are acceptable. *Verbalisations that occur spontaneously or at other times during the assessment and meet the above criteria should also receive a score of 3.*

Score	Item	Method	Response
2	Vocalization/ Oral movement	Observe for non-reflexive oral movements, spontaneous vocalizations or vocalizations that occur during administration of vocalization commands (see page 3)	At least **1** episode of nonreflexive oral movement (i.e., suggesting an attempt to speak, mouth opening other than yawning, lip licking, or any other oral movement that cannot be accounted for by reflexes) and/or vocalization occurs spontaneously or in response to application of sensory stimulation *Yawning is scored as reflexive oral movement.*
1	Oral reflexive movement	Present tongue blade between patient's lips and/or teeth	There is clamping of jaws, tongue pumping or chewing movement spontaneously or following introduction of tongue blade into mouth.
0	None	See above	No response to any of the above.

COMMUNICATION SCALE ©2004			
Administer only if a score of 3 or 4 is achieved on the auditory subscale, a score of 3 is achieved on the Verbal/Oromotor Scale, or there is evidence of spontaneous communication (e.g., gestural or verbal yes/no responses during the exam).			
Score	**Item**	**Method**	**Response**
2	Functional: Accurate	Administer the 6 Situational Orientation questions from the Communication Assessment Protocol (page 12). The examiner may use the Visual Set, Auditory set or both sets, if appropriate. Repeat the question once within 10 seconds.	Clearly discernible and accurate responses (e.g head nods/shakes, thumbs up) occur within 10 seconds on all **6** of the Visual **or** Auditory situational orientation questions from the Communication assessment protocol (see page 9)
1	Non-functional: Intentional	Same as above.	A clearly discernible communicative response* (e.g head nods/shakes, thumbs up) must occur within 10 seconds on at least **2** of the 6 Situational Orientation questions of either set (irrespective of accuracy).
0	None	See above.	No discernible verbal or non-verbal communication responses occur at any time.

COMMUNICATION ASSESSMENT PROTOCOL ©2004	
Situational orientation	
Visually based	**Aurally based**
Am I touching my ear right now? (touch nose)	Am I clapping my hands right now? (do not clap)
Am I touching my nose right now? (touch nose)	Am I clapping my hands right now? (clap)
Am I touching my ear right now? (touch ear)	Am I clapping my hands right now? (clap)
Am I touching my ear right now? (touch nose)	Am I clapping my hands right now? (do not clap)
Am I touching my nose right now? (touch ear)	Am I clapping my hands right now? (clap)
Am I touching my ear right now? (touch ear)	Am I clapping my hands right now? (do not clap)

AROUSAL SCALE ©2004			
Score	**Item**	**Method**	**Response**
3	Attention	Observe consistency of behavioral responses following verbal or gestural prompts	There are **no more than 3 occasions** across the duration of the evaluation in which the patient fails to respond to a verbal or gestural prompt.
2	Eye opening without stimulation	Observe status of the eyelids across length of assessment	Eyes remain open across the length of the examination without the need for tactile, pressure or noxious stimulation.
1	Eye opening with stimulation	Same as above	Tactile, pressure or noxious stimulation must be applied at least once during the examination in order for the patient to sustain eye opening (the length of time the eyes remain open may vary and is not considered in the scoring).
0	Unarousable	Same above	No eye opening noted. Note, if the eyes do not open but MCS behaviors are scored, the Arousal subscale is scored as “not testable”.

ASSESSMENT OF CONTINGENT BEHAVIOR ©2004 (supplementary item)			
Score	**Item**	**Method**	**Response**
Not scored	Contingent vocalization/ Gesture/ Affective response	1. Vocalizations, gestures and affective responses are assessed through a combination of reports from family and clinicians, and direct observations from treating staff. Family and clinical staff should be questioned about any vocalizations, gestures or affective responses (i.e., (smiling, laughing, frowning, crying) that are observed to occur spontaneously or in response to a specific stimulus.	A vocalization, gesture or affective response occurs significantly more often in response to a specific eliciting stimulus, than when the stimulus is absent. *Contingent responses do not include those that occur following administration of noxious stimuli.*
		2. If above response is based on report, staff should attempt to directly elicit the behavior again with the assistance of the individual who reported it.	

Score	Item	Method	Response
Not scored	Contingent vocalization/ Gesture/ Affective response	3. If affective responses are observed during direct examination, the examiner should attempt to re-elicit the behavior using the same eliciting stimulus previously noted to produce the behavior. Examples of appropriate eliciting stimuli include verbal requests ('What's your name?'), limb gestures (waves), facial gestures (sticking out tongue) and pictures (family photos).	A vocalization, gesture or affective response occurs significantly more often in response to a specific eliciting stimulus, than when the stimulus is absent. *Contingent responses do not include those that occur following administration of noxious stimuli.*
		4.The examiner should document: a. The nature of the eliciting stimulus (e.g. Verbal: 'Are you feeling sad?', Limb gesture: handshake); b. Specific characteristics of the behavioral response (e.g. facial grimace with tearing of the eyes, smiling, moaning); c. Number of times the behavior has been observed to occur within 10 seconds of the eliciting stimulus; d. Number of times the behavior has been observed to occur spontaneously; e. The time frame allowed for 'c' and 'd' should be specified and approximately the same.	

TEST COMPLETION CODES (TCC)	
A TCC should be assigned to each CSR-R subscale to indicate the validity of the subscale score.	
Test completion codes	
1	test completed in full - results valid
Test attempted, not completed due to:	
2.1	impaired sensory function (cortical or peripheral)
2.2	aphasia
2.3	physical injury (e.g., fracture, brachial plexus, hemiparesis)
2.4	primary language barrier
2.5	illness/medical instability
2.6	examiner error
2.7	logistical reasons
2.8	other (specify):
Test not attempted due to:	
3.1	impaired sensory function (cortical or peripheral)
3.2	aphasia
3.3	physical injury (e.g., fracture, brachial plexus, hemiparesis)
3.4	primary language barrier
3.5	illness/medical instability
3.6	examiner error
3.7	logistical reasons
3.8	other (specify):

Reference

Giacino, J., Bodien, C., & Chatelle, J. (2020). *CRS-R coma recovery scale-revised ©2004 administration and scoring guidelines*. https://www.tbims.org/combi/crs/CRS%20Syllabus.pdf