The CAM-S Score for Delirium Severity

Training Manual and Coding Guide

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Background

Delirium (acute confusional state) is a common, serious, and potentially preventable source of morbidity and mortality for older hospitalized patients. Currently, delirium affects as much as 50% of elderly hospitalized patients, with associated hospital mortality rates of 22-76%. Each year delirium complicates hospital stays for over 2.6 million older persons, involving over 17.5 million inpatient days, and accounting for annual healthcare costs of >$164 billion dollars in the United States alone (2011 USD). Substantial additional costs accrue following hospital discharge because of the increased need for institutionalization, rehabilitation, and home care.

The Confusion Assessment Method (CAM) was originally developed in 1988-1990, to improve the identification and recognition of delirium. The CAM was intended to provide a new standardized method to enable non-psychiatrically trained clinicians to identify delirium quickly and accurately in both clinical and research settings.

Since its development, the CAM has become the most widely used instrument for detection of delirium world-wide, because of both its strong validation results as well as its ease of use. The CAM instrument has been used in over 5,000 original articles to date, as either a process or outcome measure, and has been translated into over 14 languages world-wide. When validated against the reference standard ratings of geriatric psychiatrists based on comprehensive psychiatric assessment, the CAM had a sensitivity of 94-100%, specificity of 90-95%, and high inter-observer reliability in the original study of 50 patients (*Inouye, 1990*). More recently this work has been extended (*Wei, 2008*), and in 7 high-quality validation studies on over 1,000 subjects, the CAM had a sensitivity of 94% (95% CI 91-97%) and specificity of 89% (95% CI 85-94%).

This manual is intended to guide you in the use of the CAM-S. The CAM-S is a new scoring system for assessing delirium severity. The CAM-S is intended to be used in addition to the original CAM algorithm. It will not yield a delirium diagnosis but only a means to quantify the intensity of delirium symptoms a patient experiences. The CAM-S is available in short and long forms. The 4-item CAM-S short form is intended to be used with the short CAM. It takes less than 5-10 minutes to complete and is recommended for clinical practice. The CAM-S long form should be used in any research study.

In order to rate the CAM, it is important to perform formal cognitive testing. You can also use other brief instruments, such as the Short Portable Mental Status Questionnaire or the Mini-Cog. Once you have performed the cognitive testing with a patient you may move on to scoring the CAM.

CAM-S DELIRIUM SEVERITY SCORING

The CAM can be used to determine both a CAM-S Long Form and CAM-S Short Form delirium severity score.

Feature	Severity Score		
Scoring the CAM-S: Rate each symptom of delirium listed in the CAM as absent (0), mild (1), marked (2). Acute onset or fluctuation is rated as absent (0) or present (1). Add these scores into a composite. Higher scores indicate more severe delirium.			
	Not Present	**Present (mild)**	**Present (marked)**
1. ACUTE ONSET & FLUCTUATING COURSE	0	1	
2. INATTENTION	0	1	2
3. DISORGANIZED THINKING	0	1	2
4. ALTERED LEVEL OFCONSCIOUSNESS	0	*vigilant/lethargic:* 1	*stupor or coma:* 2
5. DISORIENTATION	0	1	2
6. MEMORY IMPAIRMENT	0	1	2
7. PERCEPTUAL DISTURBANCES	0	1	2
8. PSYCHOMOTOR AGITATION	0	1	2
9. PSYCHOMOTOR RETARDATION	0	1	2
10. ALTERED SLEEP-WAKE CYCLE	0	1	2
Short Form SEVERITY SCORE:	Add the scores in rows 1-4. Range is 0-7.		
Long Form SEVERITY SCORE:	Add the scores in rows 1-10. Range is 0-19.		

CAM-S Short Form Scoring Instructions

To score the CAM-S short form, rate the core features of the Confusion Assessment Method (CAM) and apply a severity score to each rating. Summarize these scores into a composite that ranges from 0-7.

A) **Scoring instructions, acute change or fluctuation:**
- If the patient experiences either an acute change or fluctuation in mental status, assign a score of 1. Otherwise, assign a score of 0.

B) **Scoring instructions, all other features:**
1. Assign scores of 0 when the feature is not present
2. Assign scores of 1 when the feature is present at a **mild** level. For the level of consciousness item, this means the patient is either vigilant or lethargic
3. Assign scores of 2 when the feature is present at **marked** (moderate to severe) level. For the level of consciousness item this means the patient is in stupor or coma

C) **Note on Missing Data:**
- If a feature is not evaluated or the assessor is uncertain about its presence or absence, do **not** assign 0. Instead, allow the rating to be missing and prorate the summary score. It is recommended to this with two items scored at minimum.

CAM-S LONG FORM DELIRIUM SEVERITY SCORING WORKSHEET

Feature	Question	Severity Score	
1. ACUTE ONSET & FLUCTUATING COURSE	Is there evidence of an acute change in mental status from the patient's baseline? Did the patient's behavior fluctuate at any point during the interview for any of the 10 features?	No: Yes:	0 1
2. INATTENTION	Did the patient have difficulty focusing attention, for example being easily distractible, or having difficulty keeping track of what was being said?	No: Yes (mild): Yes (marked):	0 1 2
3. DISORGANIZED THINKING	Was the patient's thinking disorganized or incoherent, such as rambling or irrelevant conversation, unclear or illogical flow or of ideas, unpredictable switching from subject to subject?	No: Yes (mild): Yes (marked):	0 1 2
4. ALTERED LEVEL OF CONSCIOUSNESS	Overall, how would you rate the patient's level of consciousness? - Alert (normal) - Vigilant - Lethargic - Stupor - Coma - Uncertain	Normal: Mild: vigilant or lethargic: Marked: stupor or coma:	0 1 2
5. DISORIENTATION	Was the patient disoriented at any time during the interview, such as thinking he/she was somewhere other than the hospital, using the wrong bed, or misjudging the time of day?	No: Yes (mild): Yes (marked):	0 1 2
6. MEMORY IMPAIRMENT	Did the patient demonstrate any memory problems during the interview, such as inability to remember events in the hospital or difficulty remembering instructions?	No: Yes (mild): Yes (marked):	0 1 2
7. PERCEPTUAL DISTURBANCES	Did the patient have any evidence of perceptual disturbances, for example, hallucinations, illusions, or misinterpretations (such as thinking something was moving when it was not)?	No: Yes (mild): Yes (marked):	0 1 2
8. PSYCHOMOTOR AGITATION	At any time during the interview, did the patient have an unusually increased level of motor activity, such as restlessness, picking at bedclothes, tapping fingers, or making frequent sudden changes of position?	No: Yes (mild): Yes (marked):	0 1 2
9. PSYCHOMOTOR RETARDATION	At any time during the interview, did the patient have an unusually decreased level of motor activity, such as sluggishness, staring into space, staying in one position for a long time, or moving very slowly?	No: Yes (mild): Yes (marked):	0 1 2
10. ALTERED SLEEP-WAKE CYCLE	Did the patient have evidence of disturbance of the sleep-wake cycle, such as excessive daytime sleepiness with insomnia at night?	No: Yes (mild): Yes (marked):	0 1 2
Long Form SEVERITY SCORE:	Add the scores in rows 1-10. Range is 0-19.	LF Severity Score Total (0-19)	☐
Short Form SEVERITY SCORE:	Add the scores in rows 1-4. Range is 0-7.	SF Severity Score Total (0-7)	☐

Scoring the CAM-S: Rate each symptom of delirium listed in the CAM instrument as absent (0), mild (1), marked (2). Acute onset or fluctuation is rated as absent (0) or present (1). Summarize these scores into a composite.

CAM-S Long Form Delirium Severity Scoring Instructions

The CAM-S Long form can be used to determine both a CAM-S Long and CAM-S Short score. To score the CAM-S long form, rate the core features of the Confusion Assessment Method (CAM) and apply a severity score to each rating. Summarize these scores into a composite that ranges from 0-19. Higher scores indicate more severe delirium.

A) **Scoring instructions, acute change or fluctuation:**
   - If the patient experiences either an acute change or fluctuation in mental status, assign a score of 1. Fluctuation in behavior can occur on any of the 10 features in order for the patient to receive a 1. Otherwise, assign a score of 0.

B) **Scoring instructions, all other features:**
   - Assign scores of 0 when the feature is not present
   - Assign scores of 1 when the feature is present at a **<u>mild</u>** level. For the level of consciousness item, this means the patient is either vigilant or lethargic
   - Assign scores of 2 when the feature is present at **<u>marked</u>** (moderate to severe) level. For the level of consciousness item this means the patient is in stupor or coma

C) **Note on Missing Data:**
   - If a feature is not evaluated or the assessor is uncertain about its presence or absence, do **not** assign 0. Instead, allow the rating to be missing and prorate the summary score. It is recommended to this with two items scored at minimum.

RECOMMENDED TRAINING PROCEDURE

We recommend the following procedure to initiate new interviewers to the cognitive assessment and use of the CAM. The principal investigator or project director will provide a general overview on the cognitive assessment instruments (e.g., Short Portable Mental Status Questionnaire, Mini-Cog Test, digit span tests) and the CAM. Following this, we recommend the following approach:

- One-on-one sessions where pairs of interviewers (ideally an experienced interviewer teamed with a new interviewer to orient) who practice the interviews with each other

- Pilot interviews on floors with delirious and non-delirious patients (usually 2 of each): These are done with the project director teamed with a new interviewer, and feedback is given.

- Inter-rater reliability assessments: These are done with pairs of interviewers observing the same patient. One interviewer administers the cognitive assessment and CAM, and the other observes. They both score the patient. On the next paired interview, the other interviewer performs the interview. Ideally, this should be done on 5 delirious, and 5 non-delirious patients. This process should be repeated until they achieve an agreement of 100% on presence or absence of delirium. Early paired ratings should be observed by the PI or project director.

- Special coding sessions are recommended once a month for all the interviewers with the project director to answer questions about scoring the CAM. In addition, the inter-rater reliability assessments are conducted every 6 months for the duration of the study.

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The CAM should be used in accordance with training and procedures outlined in the CAM Training Manual. Brief cognitive testing is required for accurate scoring of the CAM. At a minimum, testing of orientation and sustained attention is recommended, such as digit spans, days of week, or months of year backwards. In order to use the CAM in any research you must submit a request to our office by emailing agingbraincenter@hsl.harvard.edu and await approval.

Translations
If you would like to translate the CAM-S Delirium Severity Instrument, please email agingbraincenter@hsl.harvard.edu for guidance through this process. Include what language you would like to translate the instrument to.

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