The Short Confusion Assessment Method (Short CAM)

Training Manual and Coding Guide

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REFERENCES: Inouye SK, vanDyck CH, Alessi CA, Balkin S, Siegal AP, Horwitz RI. Clarifying confusion: The Confusion Assessment Method. A new method for detection of delirium. Ann Intern Med. 1990; 113: 941-948.

Inouye SK, Kosar CM, Tommet D, Schmitt EM, Puelle MR, Saczynski JS, Marcantonio ER, Jones RN. The CAM-S: Development and Validation of a New Scoring System for Delirium Severity in 2 Cohorts. Ann Intern Med. 2014; 160:526-533.

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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. 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 Confusion Assessment Method 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 4,000 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 short CAM. In order to rate the CAM, it is important to perform formal cognitive testing. This testing can be brief, and we provide an example of a brief (5-10 min) cognitive screening procedure in the Appendix. 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.

A. SHORT CAM QUESTIONNAIRE

Interviewer: Immediately after completing the interview, please answer the following questions based on what you observed during the interview and cognitive function test scores.

OBSERVATIONS BY INTERVIEWER

1. **ACUTE ONSET**
   a. Is there evidence of an acute change in mental status from the patient's baseline?

Go to Q1b ←	Yes	1
Go to Q2 ←	No	0
Go to Q1b ←	Uncertain	8

   b. (IF YES OR UNCERTAIN): Please describe change and source of information:

_____

_____

_____

_____

2. **INATTENTION**

a. Did the patient have difficulty focusing attention, for example being easily distractible, or having difficulty keeping track of what was being said?

Go to Q3 ← Not present at any time during interview 0

Go to Q2b ← Present at some time during interview, in mild form 1

Present at some time during interview, in marked form 2

Go to Q2c ← Uncertain 8

b. (IF PRESENT): Did this behavior fluctuate during the interview, that is tend to come and go or increase or decrease in severity?

Yes 1

No 0

Uncertain 8

c. (IF PRESENT OR UNCERTAIN): Please describe this behavior:

_____

_____

_____

_____

3. **DISORGANIZED THINKING**

a. Was the patient's thinking disorganized or incoherent, such as rambling or irrelevant conversation, unclear or illogical flow of ideas, or unpredictable switching from subject to subject?

Go to Q4 ← Not present at any time during interview 0

Present at some time during interview, in mild form 1

Go to Q3b ← Present at some time during interview, in marked form 2

Go to Q3c ← Uncertain 8

b. (IF PRESENT): Did this behavior fluctuate during the interview, that is tend to come and go or increase or decrease in severity?

Yes 1

No 0

Uncertain 8

c. (IF PRESENT OR UNCERTAIN): Please describe this behavior:

_____

_____

_____

_____

4. **ALTERED LEVEL OF CONSCIOUSNESS**

a. Overall, how would you rate this patient's level of consciousness?

CAM Complete ← Alert (Normal) 0

Go to Q4b ←

Vigilant (hyperalert, overly sensitive to environmental stimuli, startled easily)	1
Lethargic (Drowsy, easily aroused)	1
Stupor (Difficult to arouse)	2
Coma (Unarousable)	2
Uncertain	8

b. (IF OTHER THAN ALERT): Did this behavior fluctuate during the interview, that is tend to come and go or increase or decrease in severity?

Yes	1
No	0
Uncertain	8

c. (If OTHER THAN ALERT): Please describe this behavior:

_____

_____

_____

_____

B. SCORING THE SHORT CAM INSTRUMENT

There are two options for scoring the CAM, depending on what you are trying to achieve. Please review each option carefully and score accordingly. In the initial CAM validation study, the scoring criterion was stated as "acute onset and fluctuating course." However, during early studies applying this instrument, we found that the assessment of fluctuating course was often very difficult during a 10 - 20 minute interview at the bedside. In addition, we felt that using this criterion as "acute onset or fluctuating course" allowed increased sensitivity for detection for all possible delirium cases (although some specificity may have been sacrificed). In light of our desire for the CAM instrument to serve as a screening instrument with maximal sensitivity, we opted to changed this criteria on the shortened version of the CAM to an "or" specification.

1. If maximal sensitivity is desired, i.e., to detect as many cases as possible using CAM as a screening instrument, we advise using the "or" criterion in order to improve sensitivity. In these cases, it may be useful to indicate that the delirium outcome falls into the category of "possible or probable delirium". If using this option, the scoring should be as follows:

DELIRIUM IS PRESENT IF THE FOLLOWING ARE PRESENT:

Feature 1-Acute Change **or** Fluctuation (any symptom)

AND

Feature 2-Inattention

AND EITHER

Feature 3-Disorganized Thinking

OR

Feature 4-Altered Level of Consciousness

2. If maximal specificity is desired, with increased certainty of a pure diagnosis of delirium, then we advise using the "and" criterion. This will increase specificity, but may sacrifice missing some cases of delirium. In this case, the delirium outcome may be indicated as "probable or definite delirium". If using this option, the scoring is as follows:

DELIRIUM IS PRESENT IF THE FOLLOWING ARE PRESENT:

Feature 1-Acute Change **and** Fluctuation (any symptom)

AND

Feature 2-Inattention

AND EITHER

Feature 3-Disorganized Thinking

OR

Feature 4-Altered Level of Consciousness

C. 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.

D. SHORT CONFUSION ASSESSMENT METHOD (CAM)

TRAINING INSTRUCTIONS

CAM was originally validated for use based on observations made during a brief, structured interview that included a brief cognitive assessment. Currently, some formal cognitive assessment is recommended, since the validity of using CAM for unstandardized observations (e.g., routine clinical care) is poor (Reference: Inouye SK, et. al; Arch Int Med. 2001; 161: 2467-73). We recommend the Modified Mini-Cog test and digit span test.

This section is intended to evaluate for evidence of delirium (acute confusional state) based on observations you made before, during, or after the interview. This section must be completed immediately after completing the interview to assure accurate information. Your answers should be based on observations of the respondent's behavior or statements during any part of your contact with the respondent (e.g., consent, conversation, interview) that day, and need not be limited to the interview period alone.

Q1a. ACUTE ONSET

(i) Question: Is there evidence of an acute change in mental status from the patient's baseline?

(ii) Definition: Alteration in mental status (e.g., attention, orientation, cognition) that was new or worse for this patient, usually over hours to days.

(iii) Examples:

a. Family reports patient has been lethargic and incoherent for two days prior to admission
b. Nurse reports that a patient with poor short-term memory and disorientation due to time alone, suddenly became agitated, calling out to her dead husband, tearing off her clothes, and completely disoriented to time, place and person.

(iv) Note: This information must usually be obtained from a family member, caretaker, or nurse, who knows the patient's baseline mental status and has observed the patient over time.

Q1b. FLUCTUATION

(i) Question: Did the (abnormal) behavior fluctuate during the day, that is tend to come and go or increase and decrease in severity?

(ii) Examples of fluctuation:

a. INATTENTION -- At times, respondent is able to focus on questions and keep track of what is being said; at other times, interviewer cannot engage respondent, who perseverates answers or answers inappropriately.

b. SPEECH -- At times, respondent gives lucid, coherent answers, and at other times, gives nonsensical, incoherent answers.
c. LEVEL OF CONSCIOUSNESS -- At times, respondent is alert and responsive to all questions, while at other times respondent is lethargic, unresponsive, and difficult to arouse.

(iii) Note: Fluctuation requires that the patient switch back and forth between states at least twice (a full cycle).

(iv) Note: Regarding the "Acute onset/fluctuating course" criterion: Fluctuation on any symptom meets criteria for present.

The criterion was stated as "acute onset and fluctuating course" in the initial CAM validation study. However, during early studies applying this instrument, we found that the assessment of fluctuating course was often very difficult during a 10 - 20 minute interview at the bedside. In addition, we felt that using this criterion as "acute onset or fluctuating course" allowed increased sensitivity for detection for all possible delirium cases (although some specificity may have been sacrificed). In light of our desire for the CAM instrument to serve as a screening instrument with maximal sensitivity, we opted to changed this criteria on the shortened version of the CAM to an "or" specification.

In recommending to others what to do with this criterion, we recommend that the choice depend on the goals of the instrument in their study:

1. If maximal sensitivity is desired, i.e., to detect as many cases as possible using CAM as a screening instrument, we advise using the "or" criterion in order to improve sensitivity. In these cases, it may be useful to indicate that the delirium outcome falls into the category of "possible or probable delirium".

2. If maximal specificity is desired, with increased certainty of a pure diagnosis of delirium, then we advise using the "and" criterion. This will increase specificity, but may sacrifice missing some cases of delirium. In this case, the delirium outcome may be indicated as "probable or definite delirium".

Q2. INATTENTION

(i) Question: Did the patient have difficulty focusing attention, for example being easily distractible, or having difficulty keeping track of what was being said?

(ii) Definition: Reduced ability to maintain attention to external stimuli and to appropriately shift attention to new external stimuli. Respondent seems unaware or out-of-touch with environment (e.g., dazed, fixated, or darting attention).

(iii) Examples:

a. Questions must be frequently repeated because attention wanders, NOT because of decreased hearing.
b. Unable to gain respondent's attention or to make any prolonged eye contact.
c. Respondent's focus seems to be darting about room.
d. Respondent keeps repeating answer to previous question (perseveration).
e. Respondent is dazedly staring at the TV. When you ask a question, he looks at you momentarily but does not answer. He then continues to stare at the TV.
f. Cognitive function tests: errors on digit spans, Modified Mini-Cog Test, attention tasks, or other attention tests.

(iv) Note: Should be assessed separately from level of consciousness. A subject who is lethargic or stuporous may still have intact attention during periods of arousal.

Q3. DISORGANIZED THINKING

(i) Question: Was the patient's thinking disorganized or incoherent, such as rambling or irrelevant conversation, unclear or illogical flow of ideas, or unpredictable switching from subject to subject?

(ii) Definition: Disorganized thinking, as indicated by rambling, irrelevant or incoherent speech.

(iii) Examples:

a. Irrelevant or nonsense answer: You ask the respondent if they needed help with eating, and the response is: "Let's go get the sailor suits!"
b. Illogical flow of ideas: You ask the respondent, "How tall are you?" The reply is: "Tall? I need to get to the yellow brick road out there. Where's the party? My, oh no…."

(iv) Note: Patient must be able to speak or write (e.g., not comatose, intubated) to assess this item.

Q4. ALTERED LEVEL OF CONSCIOUSNESS

(i) Question: Overall, how would you rate this patient's level of consciousness? Any answer other than 'alert' indicates an abnormal level of consciousness.

Vigilant (Hyperalert)
Lethargic (Drowsy, easily aroused)
Stupor (Difficult to arouse)
Coma (Unarousable)

(ii) Definition: Defined above.

(iii) Examples:

a. Vigilant: The respondent startles easily to any sound or touch. Her eyes are wide open.
b. Lethargic: The respondent repeatedly dozes off while you are asking questions. Difficult to keep respondent awake for interview, but does respond to voice or touch.
c. Stupor: The respondent is very difficult to arouse and keep aroused for the interview, requiring shaking and/or repeated shouting.
d. Coma: The respondent cannot be aroused despite shaking and shouting.

E. SHORT CAM POST-TEST

Classify each behavior in the following categories. Choose one category that best describes the behavior:

INATTENTION
DISORGANIZED THINKING
ALTERED LEVEL OF CONSCIOUSNESS

Examples of observed behaviors

		Classification
1.	During the interview, the respondent dozes off while you are asking questions.	_____
2.	You ask the respondent, "What year is it?" and she responds with "2013". You then ask "What is the date today" and she repeats "2013". You repeat the question again clearly, yet she continues to repeat "2013"	_____
3.	The respondent startles easily at any sound or touch. His eyes are wide open.	_____
4.	You ask the respondent to tell you the reason he is admitted to the hospital. He responds, "I've gotta get to the Yellow Brick road."	_____
5.	As you begin the interview, the respondent's eyes are roving around the room. You call the respondent's name and touch her arm. She looks at you momentarily, but does not acknowledge your presence. You repeat a question several times without response. Her eyes continue to rove around the room.	_____
6.	During the interview, the respondent picks up her can of ginger ale and puts it in her flower arrangement. When you inquire as to what she's doing she remarks, "I'm trying to water the turkey plants!"	_____

CAM POST-TEST: KEY

Key - Observed Behaviors *

1. Altered level of consciousness (lethargic)

2. Inattention

3. Altered level of consciousness (vigilant)

4. Disorganized thinking

5. Inattention

6. Disorganized thinking

* One category is chosen for each item for standardization purposes, although some of these behaviors may well fit into other categories as well.

SHORT CONFUSION ASSESSMENT METHOD (CAM) WORKSHEET

Note: This worksheet should be used as an alternative to the short CAM Questionnaire. Testing of orientation and sustained attention is recommended, such as digit spans, days of week, or months of year backwards. This page can only be used to identify delirium cases. Please note it cannot be used to score severity using the CAM-S scoring system.

EVALUATOR: DATE:

I. ACUTE ONSET AND FLUCTUATING COURSE

a) Is there evidence of an acute change in mental status from the patient's baseline? No ____ Yes _____

b) Did the (abnormal) behavior fluctuate during the day, that is tend to come and go or increase and decrease in severity? No _____ Yes _____

II. 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 _____

BOX 1

III. DISORGANIZED THINKING

Was the patient's thinking disorganized or incoherent, such as rambling or irrelevant conversation, unclear or illogical flow of ideas, or unpredictable switching from subject to subject? No _____ Yes _____

IV. ALTERED LEVEL OF CONSCIOUSNESS

Overall, how would you rate the patient's level of consciousness?

-- Alert (normal)

-- Vigilant (hyperalert)

-- Lethargic (drowsy, easily aroused)

-- Stupor (difficult to arouse)

-- Coma (unarousable)

Do any checks appear in the box above? No _____ Yes _____

BOX 2

If Inattention and at least one other item in Box 1 are checked and at least one item in Box 2 is checked a diagnosis of delirium is suggested.

G. CAM SEVERITY (CAM-S) 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:

1. 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.

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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 Deena Sandos at dsandos@americangeriatrics.org and await approval.

Electronic Medical Records (EMR/EHR)
Users are permitted to use the CAM in an electronic medical record (EMR) provided that the proper acknowledgment and disclaimer are included on the EMR, and the usage complies with the guidelines on this page. Please use the format outlined in the following pdf found on the AGS CoCare: HELP website: CAM in EMR template.

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