The Confusion Assessment Method (CAM)

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. Delirium has assumed particular importance because patients over 65 years currently account for more than 48% of all days of hospital care. Currently, delirium occurs in 25-60% of older hospitalized patients, with associated mortality rates of 25-33%. Based on 1994 U.S. vital health statistics, each year delirium complicates hospital stays for over 2.3 million older persons, involving over 17.5 million inpatient days, and accounting for 8 billion dollars of Medicare expenditures. 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 4000 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%).

The CAM is usually rated by a clinical or trained lay interviewer on the basis of an interview with the patient that includes at least a brief cognitive assessment. The Mini-Mental State Examination was used in the original validation, but its use is now restricted by copyright law. A more brief assessment, the Short Portable Mental Status Questionnaire or Modified Mini-Cog Test (Pg. 25) is recommended for quick screening. Generally, the entire CAM rating takes 5-10 minutes to complete.

The attached CAM training manual has been designed to assist with the administration and coding of the CAM, and to provide supplementary information for interested clinical investigators.

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 test) 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 PI or 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 PI and 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.

CONFUSION ASSESSMENT METHOD (CAM) LONG FORM

OBSERVATIONS BY INTERVIEWER

Interviewer: Immediately after completing the interview, please answer the following questions based on what you observed during the interview, Short Portable Mental Status Questionnaire (SPMSQ) (Pg 25), and Digit Span Test.

ACUTE ONSET

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

Yes	- 1
No	- 2
Uncertain	- 8

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

_____

_____

INATTENTION

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

Not present at any time during interview	- 1
Present at some time during interview, but in mild form	- 2
Present at some time during interview, in marked form	- 3
Uncertain	- 8

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

Yes	- 1
No	- 2
Uncertain	- 8
Not Applicable (NA)	- 9

c. (IF PRESENT) Please describe this behavior:

_____

_____

_____

DISORGANIZED THINKING

3. a. 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?

Not present at any time during interview	- 1
Present at some time during interview, but in mild form	- 2
Present at some time during interview, in marked form	- 3
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	- 2
Uncertain	- 8
NA	- 9

c. (IF PRESENT) Please describe this behavior:

_____

_____

_____

ALTERED LEVEL OF CONSCIOUSNESS

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

GO TO Q5 ←	Alert (Normal)	- 1
	Vigilant (Hyperalert, overly sensitive to environmental stimuli, startled very easily	- 2
	Lethargic (Drowsy, easily aroused)	- 3
	Stupor (Difficult to arouse)	- 4
	Coma (Unarousable)	- 5
	Uncertain	- 8

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

Yes	- 1
No	- 2
Uncertain	- 8
NA	- 9

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

_____

_____

_____

DISORIENTATION

5. a. 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?

Not present at any time during interview	- 1
Present at some time during interview, but in mild form	- 2
Present at some time during interview, in marked form	- 3
Uncertain	- 8

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

Yes	- 1
No	- 2
Uncertain	- 8
NA	- 9

c. (IF PRESENT) Please describe this behavior:

_____

_____

_____

MEMORY IMPAIRMENT

6. a. Did the patient demonstrate any memory problems during the interview, such as inability to remember events in the hospital or difficulty remembering instructions?

Not present at any time during interview - 1
Present at some time during interview, but in mild form - 2
Present at some time during interview, in marked form - 3
Uncertain - 8

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

Yes - 1
No - 2
Uncertain - 8
NA - 9

c. (IF PRESENT) Please describe this behavior:

_____

_____

_____

PERCEPTUAL DISTURBANCES

7. a. 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)?

Not present at any time during interview - 1
Present at some time during interview, but in mild form - 2
Present at some time during interview, in marked form - 3
Uncertain - 8

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

Yes - 1
No - 2
Uncertain - 8
NA - 9

c. (IF PRESENT) Please describe these perceptual changes:

_____

_____

PSYCHOMOTOR AGITATION

8. a. (Part 1) 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?

Not present at any time during interview	- 1
Present at some time during interview, but in mild form	- 2
Present at some time during interview, in marked form	- 3
Uncertain	- 8

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

Yes	- 1
No	- 2
Uncertain	- 8
NA	- 9

c. (IF PRESENT) Please describe this behavior:

_____

_____

_____

PSYCHOMOTOR RETARDATION

8. a. (Part 2) 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?

Not present at any time during interview	- 1
Present at some time during interview, but in mild form	- 2
Present at some time during interview, in marked form	- 3
Uncertain	- 8

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

Yes	- 1
No	- 2
Uncertain	- 8
NA	- 9

c. (IF PRESENT) Please describe this behavior:

_____

_____

_____

ALTERED SLEEP-WAKE CYCLE

9. a. Did the patient have evidence of disturbance of the sleep-wake cycle, such as excessive daytime sleepiness with insomnia at night?

Yes	- 1
No	- 2
Uncertain	- 8

b. (IF YES) Please describe the disturbance:

_____

_____

 Adapted from: Inouye SK et al. Ann Intern Med. 1990; 113:941-8

CONFUSION ASSESSMENT METHOD (CAM) SHORT FORM WORKSHEET

EVALUATOR: DATE:

I. ACUTE ONSET AND FLUCTUATING COURSE

BOX 1

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 _____

III. DISORGANIZED THINKING

BOX 2

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 this box? No _____ Yes _____

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

CONFUSION ASSESSMENT METHOD (CAM)
TRAINING INSTRUCTIONS

General Explanation

CAM was originally validated for use based on observations made during a brief, structured interview that included the Mini-Mental State Examination (Reference: Folstein MF et al; J Psychiatr Res. 1975; 12:189-98) and Digit Span Test. 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 S.; Arch Int Med. 2001; 161: 2467-73). We recommend the SPMSP or 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.

General Guidelines

In general, each question has three parts (a, b, c). Note that questions 1 (acute onset) and 9 (sleep-wake cycle) may require information from an outside observer and follow a slightly different format. Specific details on Parts a-c for each question will be presented below. General scoring is as below:

a.--"Not present at any time during interview" - means the behavior was absent or not observed during the interview process.
--"Present at some time during the interview, but in mild form" - means the behavior was present or observed during the interview process, but did not significantly interfere with the interview process.
--"Present at some time during the interview, in marked form" - means the behavior was present or observed during the interview process, and did significantly interfere with the interview process.
-- Score as "Uncertain" when cannot assess behavior, for example, due to incomplete interview, intubation, coma, etc.

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

If observed, note whether there were times when the respondent was clear, while other times were abnormal (come and go); or did the behaviors tend to get worse and better at times (increase and decrease in severity). Not applicable (9) should be circled if the behavior was not present (skip question).

Specific examples of fluctuation:

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.

SPEECH -- At times, respondent gives lucid, coherent answers, and at other times, gives nonsensical, incoherent answers.

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.

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

c.--"(IF PRESENT) Please describe the behavior."

Describe the actual observed behavior (s) or statement (s) by respondent that led you to rate the behavior as present. Describe the behaviors in detail. For observed behavior, DO NOT GIVE YOUR IMPRESSION OR INTERPRETATION OF THE BEHAVIOR, RECORD THE ACTUAL BEHAVIOR OBSERVED.

Examples:

(i) Incorrect - "Respondent disoriented to place."

Correct - "Respondent thought she was on a ship in Hawaii."

(ii) Incorrect - "Respondent seemed inattentive."

Correct - "Respondent's attention darted around to every noise or voice in the environment. Eye contact was never made, and each question needed to be repeated 3-4 times."

For statements, DO NOT GIVE YOUR INTERPRETATION OF THE STATEMENT, GIVE RESPONDENT'S ACTUAL WORDS, VERBATIM.

Examples:

(i) Incorrect - "Respondent's speech incoherent."

Correct - "In response to 'what is the date?', respondent replied, 'Time. Time to go. Get the sailor suits. Be good boys and girls."

(ii) Incorrect - "Respondent repeated answers."

Correct - "Respondent answered '1913' to each of the orientation questions on cognitive function testing."

Note: Although answers to Cognitive Function tests may be used as supporting evidence, do not rely on these alone. Examples of other observed behaviors should be given here.

Specific Instructions

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:

-- Family reports patient has been lethargic and incoherent for two days prior to admission

-- Nurse reports that a patient with poor short-term memory and disorientation 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.

Q2a. 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:

-- Questions must be frequently repeated because attention wanders, NOT because of decreased hearing.

-- Unable to gain respondent's attention or to make any prolonged eye contact. Respondent's focus seems to be darting about room.

-- Respondent keeps repeating answer to previous question (perseveration).

-- 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.

(iv) Cognitive function tests: errors on digit spans, Modified Mini-Cog Test, attention tasks, or other attention tests.

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.

Q3a. 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:

-- (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!"

-- (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.

Q4a. ALTERED LEVEL OF CONSCIOUSNESS

(i) Question: Overall, how would you rate this patient's level of consciousness?

Alert (Normal)	- 1
Vigilant (Hyperalert, overly sensitive to environmental stimuli, startled easily)	- 2
Lethargic (Drowsy, easily aroused)	- 3
Stupor (Difficult to arouse)	- 4
Coma (Unarousable)	- 5
Uncertain	- 8

(ii) Definition: Defined above.

(iii) Examples:

-- Vigilant: The respondent startles easily to any sound or touch. Her eyes are wide open.

-- 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.

-- Stupor: The respondent is very difficult to arouse and keep aroused for the interview, requiring shaking and/or repeated shouting.

-- Coma: The respondent cannot be aroused despite shaking and shouting.

Q5a. DISORIENTATION

(i) Question: 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?

(ii) Definition: Impaired ability to locate oneself in one's environment, in reference to time, place or person.

(iii) Examples:

-- During the interview in the hospital, respondent thinks she is at home.

-- Respondent thinks it is night-time, during the day.

-- Respondent repeatedly thinks you are her grand-daughter (NOT due to vision problems).

(iv) Cognitive function tests: errors on orientation items.

Q6a. MEMORY IMPAIRMENT

(i) Question: Did the patient demonstrate any memory problems during the interview, such as inability to remember events in the hospital or difficulty remembering instructions?

(ii) Definition: Inability to learn new material or to remember past or recent events.

(iii) Examples:

-- During the interview, respondent cannot recall how many children she has, nor her height and weight.

-- Although respondent is alert and attentive, with intact vision and hearing, he cannot follow the instructions on the performance tasks.

-- Respondent cannot state why or for how long he has been in the hospital.

(iv) Cognitive function tests: errors on memory or recall items.

Q7a. PERCEPTUAL DISTURBANCES

(i) Question: 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)?

(ii) Definition: Visual or auditory misinterpretations, illusions, or hallucinations.

(iii) Examples:

-- (Auditory hallucinations) Respondent heard spouse and children speaking to him. No one was there.

-- (Visual hallucination) Respondent saw wife in room. No one was there.

-- (Auditory misinterpretation) Respondent hears beeper in hall, and thinks it is a siren.

-- (Visual misinterpretation) Respondent sees pile of laundry next to bed and thinks it is someone sitting there.

(iv) Note: Illusions and misinterpretations arise from a false impression of an actual stimulus. With hallucinations, no stimulus is actually present.

Q8a. (Part 1) PSYCHOMOTOR AGITATION

(i) Question: 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 or position?

(ii) Definition: Greatly increased level of activity as compared with the norm. These behaviors would indicate restlessness or agitation. Cardinal features include: repeated or constant shifting of position, increased speed of motor responses, repetitive movements (e.g., grasping/picking behaviors). May be voluntary or involuntary.

(iii) Examples:

-- The respondent appears “antsy”, and is constantly shifting his position in bed.

-- The respondent is repeatedly pulling at her sheets and IV tubing (NB: behavior appears inappropriate and purposeless).

-- The respondent is pacing about the room during the interview.

(iv) Note: Should be assessed separately from level of consciousness. Psychomotor agitation may be present even in the face of stupor.

Q8b. (Part 2) PSYCHOMOTOR RETARDATION

(i) Question: 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?

(ii) Definition: Greatly reduced or slowed level of activity as compared with the norm. These behaviors indicate sluggishness, slowing. Cardinal features include: decreased movement, slowness of motor responses, staring (but still aware of environment). May be voluntary or involuntary.

(iii) Examples:

-- Prolonged delay between when interviewer asks question and respondent begins to answer.
-- Respondent moves body very slowly to pick up a glass.

-- Respondent stares into space, but is still aware of the environment.

(iv) Note: Respondent need not be lethargic (altered level of consciousness) to have slowness of response. Should be assessed separately from level of consciousness. Psychomotor retardation may be present with normal level of consciousness; also, patients with lethargy, stupor do NOT necessarily have psychomotor retardation.

Q9a. ALTERED SLEEP-WAKE CYCLE

(i) Question: Did the patient have evidence of disturbance of the sleep-wake cycle, such as excessive daytime sleepiness with insomnia at night?

(ii) Definition: Alteration in the patient's usual sleep-wake cycle, ranging from hypersomolence to insomnia to reversal of the sleep-wake cycle (e.g., frequent napping during the day and insomnia at night.)

(iii) Examples: as per definition.

(iv) Note: Information must sometimes be obtained from nurse or caretaker.

CAM PRETEST

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

INATTENTION
DISORGANIZED THINKING
ALTERED LEVEL OF CONSCIOUSNESS
DISORIENTATION
MEMORY IMPAIRMENT
PERCEPTUAL DISTURBANCE
PSYCHOMOTOR RETARDATION (DECREASED LEVEL OF ACTIVITY)
PSYCHOMOTOR AGITATION (INCREASED LEVEL OF ACTIVITY)

Examples of observed behaviors	Classification
1. You ask the respondent for his phone number. After probing, it is clear he doesn't know.	_____
2. During the interview, the respondent dozes off while you are asking questions.	_____
3. 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"	_____
. 4. The respondent's breakfast tray comes in. She asks "why are they bringing me eggs for dinner?"	_____
5. The respondent startles easily at any sound or touch. His eyes are wide open.	_____
6. 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."	_____
7. As you interview the respondent, she keeps looking over at the bedside. Suddenly, she blurts out, "What is that man doing there?" (There's no one there.)	_____
8. As you begin the interview, the respondent's eyes are roving around the room without focusing. 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.	_____

9. You walk into the hospital room and introduce yourself to the respondent. He asks, “What are you doing in my home?” _____

10. The respondent complains about all the birds flying around in the room. _____

11. The respondent angrily wonders why she has not received her insulin shots for the last three days. You check the Med. Sheets and see she has received one each day. _____

12. During the interview, the respondent is continuously rolling over in bed, sitting up, covering/uncovering himself. _____

13. Between questions, the respondent seems to be carrying on a conversation with her husband (who is not present). _____

14. 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!” _____

15. Half way through the interview, you ask a question and the respondent just stares into space and says nothing. Surprised, you wonder if you suddenly weren’t speaking loudly enough and you repeat the question clearly. She continues to stare and says nothing. You take a step closer, ask if she is okay and she shifts her position and says, “Yes I’m fine, thanks.” You repeat the question and she answers with no hesitation. _____

.

16. The respondent remains in bed motionless throughout the interview. He moves <u>very</u> slowly to do the performance tasks. _____

CAM PRETEST: KEY

Key - Observed Behaviors *

1. Memory impairment
2. Altered level of consciousness (lethargic)
3. Inattention
4. Disorientation
5. Altered level of consciousness (vigilant)
6. Disorganized thinking
7. Perceptual disturbance (visual hallucinations)
8. Inattention
9. Disorientation
10. Perceptual disturbance (visual hallucinations)
11. Memory impairment
12. Psychomotor agitation
13. Perceptual disturbance (auditory hallucinations)
14. Disorganized thinking
15. Inattention
16. Psychomotor retardation

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

SCORING THE CAM INSTRUMENT

a. Scoring: Delirium scored as 'present' (1) or 'absent' (0), based on the following criteria. These definitions are based on the validated Confusion Assessment Method (CAM) criteria. [Reference: Inouye SK et al; Annals of Internal Medicine. 1990; 113:941-8].

Score delirium as present (1) if meets the following criteria:

(i) Acute onset
CAM 1a = 1 (Yes)

-OR-

Fluctuating course
CAM 2b OR 3b OR 4b = 1 (Yes)

-AND-

(ii) Inattention
CAM 2a = 2, 3

-AND EITHER-

(iii) Disorganized thinking
CAM 3a = 2, 3

-OR-

(iv) Altered level of consciousness
CAM 4a = 2, 3, 4, 5

b. Calculation Notes:

1. For CAM 1a, set 8 to missing. For CAM 2b, 3b, 4b -- set 8 to missing. 'Not applicable' (9) is equivalent to 'No' (2) (since this would be a skip question). If any one of these items has a non-missing value, can still rate 'acute onset/fluctuating course'. If all are missing, cannot rate 'acute onset/fluctuating course and delirium score is missing.

2. For CAM 2a, set 8 to missing. If this item is missing, delirium score is missing.

3. For CAM 3a and 4a, set 8 to missing. Can score delirium as long as one of these items has a non-missing value.

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ADAPTATIONS OF THE CAM

The CAM has been adapted for use in the ICU, emergency department, and nursing home settings, for measurement of severity, and for use by telephone. References for these adaptations below:

i) Dosa D, Intrator O, McNicoll L, Cang Y, Teno J. Preliminary derivation of a Nursing Home Confusion Assessment Method based on data from the Minimum Data Set. J Am Geriatr Soc. 2007;55:1099-105.
ii) Ely EW. Delirium in mechanically ventilated patients; validity and reliability of the Confusion Assessment Method for the intensive care unit (CAM-ICU). JAMA. 2001;286:2703-10.
iii) Han JH, Wilson A, Vasilevskis EE, Shintani A, Schnelle JF, Dittus RS, Graves AJ, Storrow AB, Shuster J, Ely EW. Diagnosing delirium in older emergency department patients: validity and reliability of the delirium triage screen and the brief confusion assessment method. Ann Emerg Med. 2013; 62:457-65.
iv) Lewis LM et al. Unrecognized delirium in ED geriatric patients. Am J Emerg Med. 1995;13:142-45.
v) McCusker J et al. Reliability and validity of a new measure of severity of delirium. International Psychogeriatrics. 1998;10:421-33.
vi) Marcantonio ER et al. Diagnosing delirium by telephone. J Gen Intern Med. 1998;13:621-23.

Short Portable Mental Status Questionnaire (SPMSQ)	The Confusion Assessment Method (CAM)
1. What is the date today? 2. What day of the week is it? 3. What is the name of this place? 4. What is your telephone number? 4a. What is your street address? (ask only if subject does not have a phone) 5. How old are you? 6. When were you born? 7. Who is the president of the United States now? 8. Who was president just before him? 9. What was your mother's maiden name? 10. Subtract 3 from 20 and keep subtracting 3 from each new number all the way down. <u>Scoring</u> > 2 errors suggests cognitive impairment Ref: Pfeiffer E. A short portable mental status questionnaire for the assessment of organic brain deficit in elderly patients. J Am Geriatr Soc. 1975;23(10):433-41. Used with permission.	(1) <u>ACUTE ONSET AND FLUCTUATING COURSE</u> Is there evidence of an acute change in mental status from the patient's baseline? Did this behavior fluctuate during the past day, that is, tend to come and go or increase and decrease in severity? (2) <u>INATTENTION</u> Does the patient have difficulty focusing attention, for example, being easily distractible, or having difficulty keeping track of what was being said? (3) <u>DISORGANIZED THINKING</u> Is the patient's speech disorganized or incoherent, such as rambling or irrelevant conversation, unclear or illogical flow of ideas, or unpredictable switching from subject to subject? (4) <u>ALTERED LEVEL OF CONSCIOUSNESS</u> Overall, how would you rate this patient's level of consciousness? Alert (normal) Vigilant (hyperalert) Lethargic (drowsy, easily aroused) Stupor (difficult to arouse) Coma (unarousable) THE DIAGNOSIS OF DELIRIUM REQUIRES A PRESENT/ABNORMAL RATING FOR CRITERIA: (1) AND (2) AND EITHER (3 OR 4) Ref: Inouye SK, et al. Ann Intern Med. 1990;113:941-8. Copyright © 1988, 2003 Hospital Elder Life Program.

It is recommended that you print this page out, place back to back and laminate for use as a reference tool.

FREQUENTLY ASKED QUESTIONS ABOUT THE CAM

I. Regarding the "Acute onset/fluctuating course" criterion:

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".

II. Should we ask and score questions 5-9?

Questions 5-9 were included in the original validation study (and many investigators use them to fulfill the entire DSM-III-R definition), thus they were included in the instrument. In our studies, we still use the entire instrument for this reason (referred to as the “long CAM”).

However, it is perfectly justified to just use questions 1-4 (referred to as the “short CAM”), as this definitional portion has been fully validated. Many studies are using the shortened form.

III. How changes in DSM-IV criteria relate to the CAM:

The CAM criteria agree more closely with the current DSM-IV criteria than they did with the previous DSM-III-R criteria. Thus, I would recommend continuing to use the CAM criteria. In DSM-IV, Criterion B "Changes in cognition, that are not better accounted for by a pre-existing dementia" is somewhat vague, and disorganization of thought is most likely the key element here.

However, for investigators who feel uncomfortable using the CAM criteria, the longer form of the CAM instrument will facilitate collection of all information needed to rate both DSM-IV and DSM-III-R criteria.

IV. Can the CAM be scored based on routine clinical observations or a brief conversation with the patient?

The CAM was designed and validated to be scored based on observations made during brief but formal cognitive testing, such as the Modified Mini-Cog Test, Pg. 25 (or other brief mental status evaluation). Our previous work, as well as the work of others, that the diagnostic accuracy of the CAM is directly influenced by the quality of the observations made. Based on observations made solely during routine clinical care, nursing staff missed delirium in nearly 80% of observations and 70% of cases (Reference: Inouye SK et al, Arch Intern Med 2001;161:2467-2473, see attached). Thus, we strongly recommend that the CAM be scored based on formal cognitive evaluation.

V. Can the CAM be used to rate severity of delirium?

Yes, the CAM-S severity scoring system can be used to rate the severity of delirium. Please see the CAM-S information and training manual available at: <www.hospitalelderlifeprogram.org>.

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National Institute for Health and Clinical Excellence. Delirium: Diagnosis, Prevention and Management (Clinical Guideline 103) [on-line]. Available at http://www.nice.org.uk/guidance/cg103/chapter/guidance

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