

## The Confusion Assessment Method (CAM)

By: Christine M. Waszynski, MSN, APRN, BC, Hartford Hospital

**WHY:** Delirium occurs in 25-60% of older hospitalized patients, and is associated with an increased risk of nursing home admission, increased costs, length of stay, mortality rates, functional decline, and increased use of chemical and physical restraints. Risk factors for delirium include older age, dementia, infection, severe illness, multiple co-morbidities, dehydration, psychotropic medication use, alcoholism, vision impairment, and fractures. Delirium is often unrecognized by clinicians. Therefore, patients should be assessed frequently using a standardized tool to facilitate prompt identification and management of delirium and underlying etiology.

**BEST TOOL:** The Confusion Assessment Method (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. Both a long and short version of the CAM are available. The long version is a comprehensive assessment instrument that screens for clinical features of delirium and correlates to DSM IV criteria. The short version includes only those four features that were found to have the greatest ability to distinguish delirium from other types of cognitive impairment. There is also a CAM-ICU version for use with non-verbal mechanically ventilated patients.

**VALIDITY AND RELIABILITY:** Both the CAM and the CAM-ICU have demonstrated sensitivity of 94-100%, specificity of 89-95% and high inter-rater reliability. Several studies have been done to validate clinical usefulness.

**STRENGTHS AND LIMITATIONS:** The CAM can be incorporated into routine assessment and has been translated into several languages. The CAM was designed and validated to be scored based on observations made during brief but formal cognitive testing, such as the Mini-Mental State Examination (or other brief mental status evaluations). There is a false positive rate of 10%. Training to administer and score the tool is necessary to obtain valid results. The tool identifies the presence or absence of delirium but does not assess the severity of the condition, making it less useful to detect clinical improvement or deterioration.

**FOLLOW-UP:** The presence of delirium warrants prompt intervention to identify and treat underlying causes and provide supportive care. Vigilant efforts need to continue across the healthcare continuum to preserve and restore baseline mental status.

### MORE ON THE TOPIC:

Best practice information on care of older adults: [www.ConsultGerIRN.org](http://www.ConsultGerIRN.org).

The Hospital Elder Life Program (HELP), Yale University School of Medicine. Home Page: <http://elderlife.med.yale.edu>.

Useful websites for clinicians including the CAM Training Manual: <http://elderlife.med.yale.edu/public/doclinks.php?pageid=01.02.03>.

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## The Confusion Assessment Method Instrument:

1. **[Acute Onset]** Is there evidence of an acute change in mental status from the patient's baseline?
- 2A. **[Inattention]** Did the patient have difficulty focusing attention, for example, being easily distractible, or having difficulty keeping track of what was being said?
- 2B. **(If present or abnormal)** Did this behavior fluctuate during the interview, that is, tend to come and go or increase and decrease in severity?
3. **[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?
4. **[Altered level of consciousness]** . Overall, how would you rate this patient's level of consciousness? (Alert [normal]; Vigilant [hyperalert, overly sensitive to environmental stimuli, startled very easily], Lethargic [drowsy, easily aroused]; Stupor [difficult to arouse]; Coma; [unarousable]; Uncertain)
5. **[Disorientation]** Was the patient disoriented at any time during the interview, such as thinking that he or she was somewhere other than the hospital, using the wrong bed, or misjudging the time of day?
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?
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)?
- 8A. **[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?
- 8B. **[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?
9. **[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?

## The Confusion Assessment Method (CAM) Diagnostic Algorithm

### Feature 1: Acute Onset or Fluctuating Course

This feature is usually obtained from a family member or nurse and is shown by positive responses to the following questions: Is there evidence of an acute change in mental status from the patient's baseline? Did the (abnormal) behavior fluctuate during the day, that is, tend to come and go, or increase and decrease in severity?

### Feature 2: Inattention

This feature is shown by a positive response to the following question: Did the patient have difficulty focusing attention, for example, being easily distractible, or having difficulty keeping track of what was being said?

### Feature 3: Disorganized thinking

This feature is shown by a positive response to the following 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?

### Feature 4: Altered Level of consciousness

This feature is shown by any answer other than "alert" to the following question: Overall, how would you rate this patient's level of consciousness? (alert [normal]), vigilant [hyperalert], lethargic [drowsy, easily aroused], stupor [difficult to arouse], or coma [unarousable])

**The diagnosis of delirium by CAM requires the presence of features 1 and 2 and either 3 or 4.**

CAM Instrument and Algorithm adapted from Inouye, S., van Dyck, C., Alessi, C., Balkin, S., Siegel, A. & Horwitz, R. (1990). Clarifying confusion: the confusion assessment method. *Annals of Internal Medicine*, 113(12), 941-948. Reprinted with permission.