The Ultra-Brief Confusion Assessment Method (UB-CAM)

A New Approach for Rapid Diagnosis of CAM-Defined Delirium

The UB-CAM can be used for quick bedside assessment of delirium. It uses items of the 3DCAM and adaptive testing for an even quicker CAM-based diagnostic assessment. The UB-CAM is a 2-step protocol that begins with the UB-2, a 2-item ultra-brief delirium screen. For those who screen negative, the assessment ends (delirium is not present). Those who screen positive go on to receive additional 3D-CAM items using a skip pattern to shorten administration time. The UB-CAM can be completed in about 1 minute on average (35-40 seconds for the UB-2 only, and 1 minute 30 seconds for UB-2 + 3D-CAM with skip). Similar to 3D-CAM, the UB-CAM performs very well compared to an expert evaluation.

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The 3D-CAM. The Confusion Assessment Method (CAM) (1) has a 30-year track record during which it has become the standard for delirium identification in both clinical care and research. Moreover, the CAM diagnostic algorithm defines a clear phenotype for delirium. In applying the CAM over the past 3 decades, a number of questions have arisen: 1) what are the best questions for assessing each of the CAM diagnostic features?, 2) how many "positive" items (e.g. wrong answers) are needed to endorse the presence of each feature?, and 3) can we make the assessment as short as possible? To address all of these questions, we developed the 3-Minute Diagnostic Assessment for CAM-defined delirium (3D-CAM). Using a database of nearly 5000 CAM assessments with over 120 assessment items each, we used modern measurement methods to identify the best items to assess each CAM diagnostic feature (2). We determined the number of "positives" required for the presence of each feature, which turned out to be one! And, we put the cognitive testing and CAM algorithm together in a short structured assessment that is easy to apply on the wards. We then prospectively validated the 3D-CAM in 201 general medicine patients—a purposeful "challenge" sample with average age over 80, and nearly a third with dementia. In comparison to the "gold standard" clinical evaluation for delirium, the 3D-CAM (performed blinded to the gold standard) had outstanding test characteristics, with sensitivity of 95% and specificity of 94% (3). Moreover, it performed well in challenging groups, such as those with hypoactive delirium, and delirium superimposed on dementia, and took only 3 minutes to perform.

The 3D-CAM is now freely available along with a User's Manual at the below url:
(https://help.agscocare.org/chapter-abstract/chapter/H00101/H00101_PART001_006)
The 3D-CAM has also been translated into 10 languages, and has been widely adopted in both clinical and research settings. Two methods for measuring delirium severity using the 3D-CAM that require no additional questions/ratings are also available (4, 5).

The UB-2. Shortly after publication of the 3D-CAM, several of our colleagues challenged us to make it even shorter. We surmised that using a highly sensitive ultra-brief screener at the start of the assessment could rule out delirium quickly, and reduce the fraction of patients requiring the full 3D-CAM. Using the pool of 3D-CAM items, we identified two items—*Months of the Year Backwards*, and *What is the Day of the Week*?—as the most sensitive pair of items for the presence of delirium. Ability to answer both questions correctly is considered a negative screen; anything else (either one or both questions answered incorrectly or not at all) is considered positive. This new Ultra-Brief 2-Item Screen, the UB-2, takes 35-40 seconds to administer, and has 93% sensitivity for delirium, but only 64% specificity (6). Negative screens can quickly rule out delirium, while positive screens require further evaluation to determine if delirium is present. The UB-2 is very easy to complete and requires only a few minutes to train staff. It has been administered by nursing assistants at the bedside with high sensitivity. A short free training video on the UB-2 is available at www.nursing.psu.edu/readi.

The UB-CAM. Since the UB-2 items come from the 3D-CAM, it makes sense to use them together as a two-step protocol to identify CAM-defined delirium (7). Additionally, since the presence of only one positive item triggers presence of a CAM feature in the 3D-CAM, we developed a skip pattern—as soon as one "sign" (an incorrect answer or positive patient symptom report or interview observation) is positive, the remainder of the items in that feature can be skipped—to further shorten the instrument. We call the combination of the UB-2 followed in "positives" by the 3D-CAM with skip the Ultra-Brief CAM (UB-CAM). In preliminary studies, it is highly accurate, with sensitivity of 93% and specificity of 95%, and can be completed in about 1 minute (median 40 seconds, mean 74 seconds) (8). We attach a simple paper form that leads the assessor through the UB-CAM. While the UB-CAM has 20 items, only a minority are asked in most encounters—the median number of items administered is 2, and the mean is 6. Moreover, delirium is diagnosed quickly in severely impaired patients, and ruled out quickly in intact patients. So, the most items are administered to those with intermediate levels of impairment, as is appropriate. Given the adaptive testing approach (the questions asked depend on answers to previous questions) we have developed a UB-CAM App, which makes administration even easier, and are working on refining it for release in the near future. The UB-CAM's speed, accuracy, and ability to identify CAM-defined delirium offers advantages over all other brief delirium identification tools available at this time. For questions about the UB-CAM, please reach us at 3DCAM@bidmc.harvard.edu.

References

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Delirium Assessment Specifics

There are 4 key features of delirium that are identified in 2 ways:

      1) By asking the patient questions

      2) By observing the patient's speech and behavior.

Overview: Each item in the UB-CAM instrument directly informs one of the 4 CAM features in the algorithm that leads to determining the presence or absence of delirium. For all items, if the patient's answer is 'incorrect', 'yes', 'don't know', 'no response', or 'non-sensical response', then the feature is present. The CAM algorithm is considered positive if the following features are present: Feature 1) Acute onset or fluctuating course **and** Feature 2) Inattention **and either** Feature 3) Disorganized thinking **or** Feature 4) Altered level of consciousness. Here are some general guidelines and tips:

1. The interview "begins" at the door as you observe the patient and his/her behavior on approach. It ends when you leave sight of the patient.

2. When approaching a patient, first observe patient response as he/she sees you approach. If no engagement made, seek patient's attention with progressively stronger stimuli: speak to patient, lightly touch, gently shake or tap, and lastly shake moderately to arouse.

3. Speak slowly and clearly. Do not rush. Each question can be stated twice. Make sure the patient has GLASSES and HEARING AIDS on.

4. In assessing for disturbance of behavior remember the comparison is to the norm of human behavior. No excuses or assumptions because in hospital, ill, older, just got medication, etc… Code what you see and hear

5. If patient shows increasing impatience with interview and seems to be tiring of questions, offer positive reinforcement and insure that there are just a few more questions remaining. Refused is only used when a patient actively refuses to answer the question.

6. Complete observational scoring sections of interview as soon as interview ends.

7. 'I don't know', no response at all or a non-sense response all count as 'incorrect'.

8. Review each item of the interview before completing the diagnostic algorithm.

9. The assessment of attention is key in delirium detection. Carefully observe patient's ability to maintain and appropriately shift attention during both informal and formal testing items.

10. In cases of incomplete patient questioning the observational items should still be competed.

11. Jot notes describing patient behavior and performance to support observations

These training instructions will provide item-by-item guidance for the UB-CAM instrument when the full instrument is administered with no skip patterns:

1. **Severe lethargy or severe altered level of consciousness (no or minimal response to voice/touch).**
   - First approach bedside to see if the respondent notices your presence
   - Assessing level of consciousness: Utilize the following 3 successive stimuli for arousal:
     - Soft voice then louder voice
     - Gentle touch (hand, then arm)
     - Loud voice and gentle shaking of one shoulder
     - During COVID - just use progressively louder voice, no touching or shaking
   - Minimal response might be a brief opening of eyes or some movement

2. **Please tell me the day of the week.**
   - A correct answer must be exact

   Please tell me months of the year backwards, say "December" as your first month
   - If the patient stares blankly after you ask him the question, say: "Please tell me what is the month that comes before December." If the patient starts to give the months of the year backward and stops midway through answering, encourage him to continue. Say "Please keep going. What comes before (say the last month that the patient gave)?" For example, if the patient responds, December, November, then stops, the interviewer probes with "Please tell me what month comes before November. If the patient responds October, September, then stops, the interviewer can probe with "Please tell me what comes before September." If the patient cannot continue after he has been prompted twice, stop prompting and proceed to the next question.
   - Check the box on the right if there is any error (order incorrect, month(s) omitted)

3. **Please tell me the year we are in right now.**
   - A correct answer must be exact

   Please tell me what type of place is this.
   - A correct answer must be exact, for example: hospital, a rehabilitation center and/or nursing home, or home as appropriate. The patient does not have to know the actual name of the facility, just that it is a facility providing care to those who are acutely ill (if in a hospital). However, if the patient voluntarily gives the wrong name for the facility, then code incorrect

4. **Days of the Week Backwards**
   - If the patient stares blankly after you ask him the question, say: "Please tell me what is the day that comes before Saturday." If the patient starts to give the days of the week backward and stops midway through answering, encourage him to continue. Say "Please keep going. What comes before (say the last day that the patient gave)?" For example, if the patient responds, Saturday, Friday, then stops, the interviewer probes with "Please tell me what day comes before Friday. If the patient responds Thursday, Wednesday, then stops, the interviewer can probe with "Please tell me what comes before Wednesday." If the patient cannot continue after he has been prompted twice, stop prompting and proceed to the next question.
   - Check the box on the right if there is any error (order incorrect, days(s) omitted)

Digits Backwards
- Make eye contact and attempt to gain the patient's attention. Say digits at a rate of one per second. Numbers may not be repeated. If asked to repeat, say, "I'm sorry I can only say them once. Let's try the next one." Directions may be repeated once.
- Score of 'correct' is given only if completely correct and 'error' if not. Please go through both items regardless of whether or not preceding item is done correctly.

5. **Over the past day have you felt confused?**
- Can prompt with "Any time in the last 24 hours" if they say "Well not today but I was last night". Can also rephrase to say "Have you felt mixed up about anything you normally wouldn't feel mixed up about?"
- Code only if confused about basic information like where they are, the date, or reason for hospitalization, not details of medical condition and/or treatment and not because of the current questioning

During the past day did you think that you were not really here [in the hospital]?
- Can give an example 'For example, did you wake up in the middle of the night or this morning and think you were at home?'
- Transient disorientation upon waking should not be counted (i.e. <15 seconds after waking).

During the past day, did you see things that were not really there?
- If the patient does not understand the question or if you feel you need to rephrase the question, say "Sometimes in the hospital, people feel mixed up and think strange things have happened to them. I want to know whether any of these things have happened to you. For example, did you think you saw a cup on the table and when you reached for it, it wasn't there"?
- If the patient reports no perceptual disturbances in response to this question but verbally reports having a disturbance later at another point in the interview, rephrase the appropriate questions and ask whether the patient did actually have the experience. For example say, "Now let me make sure that I understand you. Did you say that you thought you saw....?" Then find out exactly when it happened, that is, whether it happened within the last 24 hours. If the response is yes, within 24 hours, change the appropriate response category to reflect this. This might also suggest evidence of disorganized thinking, in that the patient made a contradictory statement.

CAM Algorithm: Part 2 - Interviewer Ratings

6. **Was the patient sleepy during the interview? (requires that they actually fall asleep)**
- Note: the term "sleepy" is used in a clinical or neurological sense in terms of having difficulty staying awake, not in common language usage as in "I'm feeling sleepy".
- When entering the room and waking a patient up the first time, this initial 'wake up' is allowed as normal. This item should only be coded when there is evidence of falling asleep while you are still in the room.
- After the initial wake up upon entering the room the patient only needs to fall asleep once during your time with him/her to be considered sleepy. It is expected that someone would be able to stay awake while being interviewed and if not, even if only once and briefly, this item should be coded as yes (altered level of consciousness)

- If patient keeps eyes closed for entire interview but answers questions correctly do not score as sleepy. Evidence of actually falling asleep is needed to be coded as sleepy (see below).
    i. To determine if someone is really asleep, you will need to be patient. If you do not get a response to a question and the patient has their eyes closed, please wait at least 15-20 seconds to see if they respond spontaneously. If they do not respond, carefully look for additional signs of sleep (eyes rolled back, head bobbing, snoring, twitching, etc.).
    ii. If eyes are closed with no signs of sleep, say their name and ask them if you should repeat the question or if they were 'just thinking'

Did the patient show hypervigilance?
- This is defined as having excessively strong responses to ordinary objects/stimuli in the environment, being inappropriately startled
- Also defined as: patient seems extremely watchful, constantly scanning the environment and focusing on objects, excessively absorbed with objects, patient appears hypervigilant because he is carrying out a specific task, for example, when a sharp but not particularly strong noise is heard in the environment, and the patient nearly jumps out of bed, and says, "What was that?!" in a highly distressed manner. There is often a foreboding quality to the hypervigilance, with the patient appearing fearful. An example of hypervigilance with this foreboding quality is when a patient seems fixated on a cardiac monitor and cringes from it, or looks afraid.

7. **Was the patient's flow of ideas unclear or illogical?**
- Nonsensical speech, inappropriate answers to questions, contradictory statements or shifting unpredictably from subject to subject
- Non-sense answer: You ask the patient if they needed help with eating, and the response is: "All the bags are here."
- Contradictory statement: Patient said they slept through the night, and then later indicated the nurse kept coming in and waking them up throughout the night.
- Illogical flow of ideas: If a persistent thought(s) prevents patient from answering the interviewer's question.
    - Note: Patient must be able to speak (e.g., not comatose, intubated) to assess this item.

Was the patient's conversation rambling, inappropriately verbose, or tangential?
- Off target responses or telling a story unrelated to the interview
- Did the patient respond with rambling conversation, for example tells a story upon answering the question which is inappropriately verbose or long. Some patients are just loquacious (talkative) and take a longer time to answer the interviewer's question. The talking must be excessive and off target (something minimally related to the question) to be coded as rambling.
- Although the patient's answer might at first appear tangential, if the stories are related to the questions and the patient eventually responds to the question, this is not coded as tangential. The talking must be about something unrelated to the question, or a change of subject to be coded as tangential. For example, the interviewer is asking questions about sleep problems and the patient responds by telling you about his family or asks you whether you are married.
- Note: Patient must be able to speak (e.g., not comatose, intubated) to assess this item.

Was the patient's speech unusually limited or sparse?
- Inappropriately brief or stereotyped answers
- For limited or sparse speech, the patient doesn't initiate any conversation, but responds adequately to questions, with only yes/no responses. The interviewer might have to repeat the questions several times before the patient responds with anything more than yes/no. In severe cases, there is almost no conversation from the patient

8. **Did the patient have trouble keeping track of what was said or following instructions?**
- If the interviewer has to ask questions repeatedly before the patient responds, this is a case of the patient having trouble keeping track of the interview.
- Additional inattentive behaviors are as follows:
    - The patient does not follow what is being said during the interview, that is, he may be answering a question and in the middle looks away from the interviewer or just stops talking and does not finish responding
    - The patient loses track of the fact that he is being interviewed. For example, the patient starts to speak to someone else and doesn't come back to the interview
    - The patient can also lose track of what he is saying. The patient often has little eye contact with the interviewer. This item can also be present when the patient answers each question with the exact same response, even though it is no longer appropriate to the question.

Did the patient appear inappropriately distracted by external stimuli?
- Such as television, people outside the room, roommate's conversations
- If the patient seems inappropriately diverted by normal stimuli, code him as distractible. Such patients are generally unable to screen out easily recognizable sounds or sights. For example, the patient stops answering questions because he hears people in the hall talking, running water, or beepers. He/she is easily sidetracked by these sounds and turns his head away from the interviewer. If the patient is appropriately distracted by momentary noise, like something dropping outside his door or loud talk, do not code this as positive. A sure sign that the patient is not inappropriately distracted is when the interviewer is also distracted by the noise. He/she might also be fixated on medical objects such as intranasal oxygen, IV or urinary catheters, or EKG leads.

9. **Did the patient's level of consciousness, level of attention or speech/thinking fluctuate during the interview?**
- Fluctuation refers to consistency of a symptom or symptoms across the interview. If symptom(s) are consistent throughout, then fluctuation is not present. If symptoms tend to come and go, fluctuation is more likely present.
- Example of fluctuation of LOC:
    i. For part of the interview, patient is alert and responsive to all questions, while at other times patient is sleepy and difficult to arouse
- Example of fluctuating attention:
    i. For part of the interview, the patient is able to focus on questions and keep track of what is being said; at other times, interviewer cannot engage the patient, who perseverates or answers inappropriately.
    ii. Can assess using either informal or formal tasks of attention

1. Formal tasks (both digit spans backwards, DOW and MOY backwards): Was attention variable within or between items? Was the patient able to do the harder tasks but struggled with the easier ones?
- Example of fluctuating speech/thinking:
  i. For part of the interview, patient gives clear, coherent answers, and at other times, gives non-sense, incoherent answers

If no prior assessments, is there evidence an acute change in memory or thinking according to records, or informant?
- Consult the medical record or contact a family member, friend, or health care provider who knows the patient well to find out if the patient is experiencing an acute change. "Is the patient experiencing an acute (sudden) change in their memory or thinking?"
  - This question is asking about a recent change in behavior. Is his/her relative confused? Does he/she seem disoriented? An example would be if his/her friend or relative suddenly does not make sense at times when talking. Code the item as 'yes' if these changes are NEW and have occurred mainly in the past few hours to days. If they have been problems for many months, answer NO. If the answer is 'yes', then CAM feature 1 should be coded as positive
    - COVID guidance: If the informant has been unable to see the patient recently, you can explain any possible changes and give examples (reports hallucinations, disoriented to place, etc)
  - In the medical record look for an explanation of a change in behavior from baseline or presence of delirium "trigger" words such as "altered mental status", "mental status changes", "acute confusion", "disorientation", "hallucinations" or "reorientation". Please refer to these background articles for further information:

Inouye SK, Leo-Summers L, Zhang Y, Bogardus ST, Leslie DL, Agostini JV. A chart-based method for identification of delirium: validation compared with interviewer ratings using the Confusion Assessment Method. J Am Geriatr Soc. 2005:53:312-318

Saczynski JS, Kosar CM, Xu G, Puelle MR, Schmitt E, Jones RN, Marcantonio ER, Wong B, Isaza I, Inouye SK. A Tale of Two Methods: Chart and Interview Methods for Identifying Delirium. J Am Geriatr Soc. 2014; 62:518-524.

If prior assessments, are there any new signs of delirium based on above questions (new errors, positive ratings)?
- For example, if the patient scored worse on any of the attention items on interview Day #2, acute change can be coded on that day. The same applies for any of the 4 CAM features. If the answer is 'yes', then CAM Feature 1 should be coded as positive

Checkpoint: CAM Delirium feature assessment and rating summary
  - At least one sign of Acute Change and/or Fluctuation was noted (Feature 1)
        Present if any questions in items 5 or 9 are positive
  - At least one sign of Inattention was noted (Feature 2)
        Present if any questions in items 4 or 8 are positive or if patient makes any error during months of
        the year backwards (in item 2)
  - At least one sign of Disorganized Thinking was noted (Feature 3)
        Present if any questions in items 3 or 7 are positive or patient misses day of the week (in item 2)
  - At least one sign of Altered Level of Consciousness was noted (Feature 4)
        Present if either question in item 6 is positive

Delirium Diagnosis: Requires presence of Features 1, 2, and either 3 or 4 in checklist above, or if stupor/coma are present (in item 1).