Confusion Assessment Method for the ICU (CAM-ICU)

The Complete Training Manual

Revised Edition: October 2010

This is a training manual for physicians, nurses and other healthcare professionals who wish to use the Confusion Assessment Method for the ICU (CAM-ICU). The CAM-ICU is a delirium monitoring instrument for ICU patients. A complete detailed explanation of how to use the CAM-ICU, as well as answers to frequently asked questions and case studies are provided in this manual.

VANDERBILT UNIVERSITY MEDICAL CENTER

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Dear Colleague,

With the advent of technology and the aging of our society, critical care has quickly become a massive "business" occupying an increasingly large segment of the gross domestic product of industrialized nations worldwide. Hospitals are filled with patients suffering from complex disease processes, and there is a driving unmet need to improve care. Components of patients' diseases or hospital course that drive mortality, cost of care, and long-term outcomes such as cognitive function will serve as increasingly important foci by which to improve not only our efficiency and resource utilization, but more importantly, the ultimate quality of life of millions of humans. It is with this backdrop that I write this introduction to the revised training manual for the Confusion Assessment Method for the Intensive Care Unit (CAM-ICU).

When the CAM-ICU was designed and validated (in concert with long-standing delirium experts in Geriatrics and Neuropsychology such as Dr. Sharon Inouye, Dr. Joseph Francis, and Dr. Robert Hart), we had no idea that the need and desire to monitor delirium around the world would stimulate its translation into over 20 languages and its implementation in dozens of countries. In fact, it is hard to believe the changes that have taken place in recent years regarding our understanding of delirium in critically ill patients. All of us in medicine are resolute in our desire and vocation to serve patients and their families to the best of our abilities. Just a few years ago we could not even objectively diagnose acute brain dysfunction (delirium) in intubated ICU patients in a reliable manner, which meant that delirium could not be routinely diagnosed by bedside nurses, physicians, or other non-psychiatrically trained clinicians. Perhaps this is one of those "if you build it, they will come" stories. Following the publication in 2001 of valid and reliable tools by which to detect the onset or resolution of delirium in non-verbal patients such as those on mechanical ventilation (i.e., ICDSC [Intensive Care Delirium Screening Checklist] and CAM-ICU), we have seen an explosion of peer-reviewed publications, research teams, and large scale implementation of quality improvement initiatives around the world that reflect the prioritization of the human brain during serious illness. While none of the existing tools are perfect, and while all of them involve changing the culture of ICU bedside care, which is a challenge, the tools have enabled us to learn a tremendous amount of valuable epidemiology and management lessons already.

We have learned, for example, that duration of delirium in ICU patients is one of the strongest independent predictors of (risk factors for) death, length of stay in the hospital, cost of care, and long-term cognitive impairment. Indeed, there are few developments in the course of critical illness that portend "worse news" for a patient or his/her loved ones than the development of delirium that does not readily remit with a quick adjustment of medications or management of obvious causes. While the causes of delirium are legion, and not all delirium is "created equal," it is safe to say that we should do our best to detect its onset as early as possible in order to rectify any modifiable causes. Since hypoactive delirium generally portends a worse prognosis than hyperactive delirium and is missed in 75% of circumstances in the absence of active monitoring, it is critical to adapt delirium monitoring as standard practice in all critically ill patients.

Many ongoing and already designed investigations hopefully will continue to edify our understanding of how to handle delirium when it arises, to define subpopulations who may or may not benefit from specific pharmacological and non-pharmacological interventions, and to better communicate to patients and caregivers prognostic information and long-term planning solutions. In the meantime, the glass is way more than half full. We have much we can do with information gained by using delirium monitoring tools both individually and collectively to improve our care…and that is the ultimate goal. Good luck and please allow our team to be of service to you and your team in any way possible.

Sincerely,

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What is new in this training manual?

Since the last edition of the CAM-ICU training manual, scores of institutions have adopted the CAM-ICU to measure delirium. Many of those places have shared great ideas to improve our teaching materials. We decided to update the look of our training materials, and took the opportunity to incorporate some of these new teaching methods. This manual is intended to include all the materials necessary for training and implementation of the CAM-ICU. We envision that the manual would be used by those charged with training and only the flowsheet pocket card would be used at the bedside.

What has not changed? The essentials of the CAM-ICU (the four delirium criteria) ***have not changed***. This update only includes rewording and reordering. Same content, different look.

What is new in this update?

- **New layout** – The previous version of the training manual contained only a CAM-ICU worksheet. This edition contains both a CAM-ICU worksheet (page 7) and flowsheet (page 8). The content on each page is exactly the same; only the layout has changed. The CAM-ICU worksheet presents the information in a checklist format, while the CAM-ICU flowsheet presents the information more like an algorithm. Generally, we have found the checklist beneficial with initial teaching and the flowsheet really useful as a pocket reference. Having both available allows you to choose the style that works best for your team.

- **Reordering of Feature 3 and Feature 4**. According to the original CAM (and the DSM-IV criteria) you must have Features 1 and 2 and either 3 or 4 to be delirious. Feature 3 is identified as 'Disorganized Thinking' and Feature 4 is identified as 'Altered Level of Consciousness'. This has confused many CAM-ICU users who think the assessment must be done in numerical order (i.e., 1, 2, 3, 4). There is no rule regarding the order of assessing CAM-ICU Features. In fact, the Features are most often assessed in this order: 1, 2, 4, then 3 if necessary. Most of the time, Feature 3 is not necessary to assess in order to determine if a patient is delirious. As a result we have decided to flip the numbering of the Features so that **Feature 3 is 'Altered Level of Consciousness'** and **Feature 4 is 'Disorganized Thinking'**. Nothing has changed with the content of these Features. The numbering was changed to improve CAM-ICU ease of use and reflect bedside assessment.

- **Scoring by errors instead of number correct** – Scoring was originally described as the "number correct" for each Feature. Mentally, this was a 2-step process (add the number of errors and then subtract them from the possible total). One step is always better than two! To eliminate the extra step, the scoring is now described as "number of errors". For example, Feature 2 previously said "a score of less than 8 correct answers = Inattention." Now it reads "more than 2 errors = Inattention". The threshold has not changed; it is just worded in terms of errors instead of number correct.

Frequently Asked Questions (FAQs) – We have completely updated these.

How to use these materials? Every institution has different educational needs and implementation struggles. Please review the materials and determine what works for you and your unit. Mix and match to make it fit your team. Please don't hesitate to contact us if we can help in any way at delirium@vanderbilt.edu.

Sincerely,

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The Details About Delirium

What is Delirium?

A disturbance of consciousness characterized by acute onset and fluctuating course of inattention accompanied by either a change in cognition or a perceptual disturbance, so that a patient's ability to receive, process, store, and recall information is impaired. Delirium develops over a short period of time (hours to days), is usually reversible, and is a direct consequence of a medical condition, substance intoxication or withdrawal, use of a medication, toxin exposure, or a combination of these factors. Many delirious ICU patients have recently been comatose, indicating a fluctuation of mental status. Comatose patients often, but not always, progress through a period of delirium before recovering to their baseline mental status. **Think: rapid onset, inattention, clouded consciousness (bewildered), fluctuating.**

ICU delirium is a predictor of: ↑ mortality, ↑ length of stay, ↑ time on vent, ↑ costs, ↑ re-intubation, ↑ long-term cognitive impairment, and ↑ discharge to long-term care facility

There are three **subtypes** of delirium: hyperactive, hypoactive and mixed. **Hyperactive** delirium is characterized by agitation, restlessness, and attempts to remove tubes and lines. **Hypoactive** delirium is characterized by withdrawal, flat affect, apathy, lethargy, and decreased responsiveness. **Mixed** delirium is when patients fluctuate between the two. In ICU patients mixed and hypoactive are the most common, and are often undiagnosed (invisible) if routine monitoring is not implemented. Few ICU patients (<5%) experience purely hyperactive delirium.

What is it not?

Dementia, which is characterized by a state of generalized cognitive deficits in which there is a deterioration of previously acquired intellectual abilities. Dementia usually develops over weeks, months, or even years with varying levels of cognitive impairment from mild to severe.
Think: gradual onset, intellectual impairment, memory disturbance, personality/mood change, no clouding of consciousness.

What is the CAM-ICU?

The Confusion Assessment Method (CAM) was created in 1990, and it was intended to be a bedside assessment tool usable by non-psychiatrists by Dr. Sharon Inouye to assess for delirium.[1] The CAM-ICU is an adaptation of this tool for use in ICU patients (e.g., critically ill patients on and off the ventilator who are largely unable to talk). Delirium is defined in terms of four diagnostic features, and is deemed present when a patient has positive Feature 1 and Feature 2 and either Feature 3 or 4 (see CAM-ICU schematic on next page).

What is the first step in assessing delirium?

Delirium assessment is actually part of the overall consciousness assessment. Consciousness is defined in two parts—**arousal level** plus **content** (see next page). The first step to assessing consciousness is to assess **level of consciousness**. This is best done using a validated sedation/arousal scale. The Richmond Agitation-Sedation Scale **(RASS)** is used in this training manual, though other tools are fine to use with the CAM-ICU. For more information on other sedation scales see question #15 on page 19 in the "Putting it into Practice" section. The next step is assessment of **content of consciousness**. At deeper levels of consciousness (i.e., RASS -4 & -5), it is difficult to ascertain content because the patient is not responsive. These levels are referred to as coma or stupor, and in those situations we do not conduct the CAM-ICU, thus referring to the patient as 'unable to assess'. However, at the lighter levels of consciousness (i.e., RASS -3 & above), patients are able to display at least the beginnings of meaningful responsiveness (i.e., response to voice). At these levels you are able to assess for clarity of thought, specifically delirium. The following pages include the CAM-ICU in a worksheet format (page 7) and in a flowsheet format (page 8) – same material, different layout. Then starting at page 9 are detailed instructions for assessing the four CAM-ICU features.

Assessing Consciousness: Linking Sedation and Delirium Monitoring

Step 1 Level of Consciousness: RASS

Scale	Label	Description	
+4	COMBATIVE	Combative, violent, immediate danger to staff	
+3	VERY AGITATED	Pulls to remove tubes or catheters; aggressive	
+2	AGITATED	Frequent non-purposeful movement, fights ventilator	
+1	RESTLESS	Anxious, apprehensive, movements not aggressive	
0	ALERT & CALM	Spontaneously pays attention to caregiver	
-1	DROWSY	Not fully alert, but has sustained awakening to voice (eye opening & contact >10 sec)	VOICE
-2	LIGHT SEDATION	Briefly awakens to voice (eyes open & contact <10 sec)	VOICE
-3	MODERATE SEDATION	Movement or eye opening to voice (no eye contact)	VOICE

If RASS is ≥ -3 proceed to CAM-ICU (Is patient CAM-ICU positive or negative?)

-4	DEEP SEDATION	No response to voice, but movement or eye opening to physical stimulation	TOUCH
-5	UNAROUSEABLE	No response to voice or physical stimulation	TOUCH

If RASS is -4 or -5 → STOP (patient unconscious), **RECHECK later**

Sessler, et al. AJRCCM 2002;166 :1338-1344.[2]
Ely, et al. JAMA 2003; 289:2983-2991.[3]

Step 2 Content of Consciousness: CAM-ICU

Feature 1: Acute change or fluctuating course of mental status

And

Feature 2: Inattention

And

Feature 3: Altered level of consciousness

Or

Feature 4: Disorganized Thinking

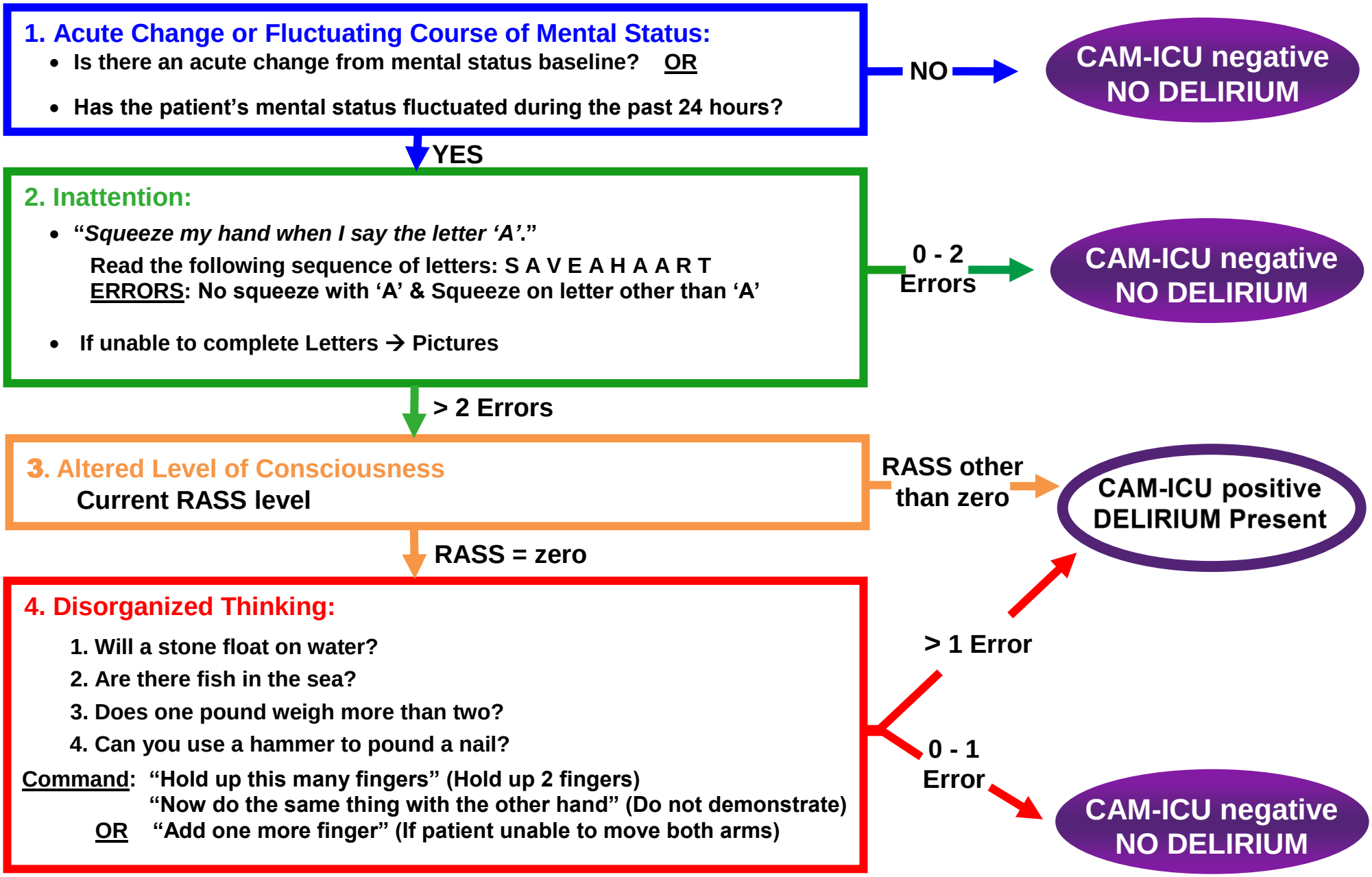
Inouye, et. al. Ann Intern Med 1990; 113:941-948.[1]
Ely, et. al. CCM 2001; 29:1370-1379.[4]
Ely, et. al. JAMA 2001; 286:2703-2710.[5]

CAM-ICU Worksheet

Feature 1: Acute Onset or Fluctuating Course	Score	Check here if Present
Is the pt different than his/her baseline mental status? OR Has the patient had any fluctuation in mental status in the past 24 hours as evidenced by fluctuation on a sedation scale (i.e., RASS), GCS, or previous delirium assessment?	Either question Yes →	☐
Feature 2: Inattention		
Letters Attention Test (See training manual for alternate **Pictures**) Directions: Say to the patient, *"I am going to read you a series of 10 letters. Whenever you hear the letter 'A,' indicate by squeezing my hand."* Read letters from the following letter list in a normal tone 3 seconds apart. **S A V E A H A A R T** **Errors are counted when patient fails to squeeze on the letter "A" and when the patient squeezes on any letter other than "A."**	Number of Errors >2 →	☐
Feature 3: Altered Level of Consciousness		
Present if the Actual RASS score is anything other than alert and calm (zero)	RASS anything other than zero →	☐
Feature 4:Disorganized Thinking		
Yes/No Questions (See training manual for alternate set of questions) 1. Will a stone float on water? 2. Are there fish in the sea? 3. Does one pound weigh more than two pounds? 4. Can you use a hammer to pound a nail? **Errors are counted when the patient incorrectly answers a question.** **Command** Say to patient: "Hold up this many fingers" (Hold 2 fingers in front of patient) "Now do the same thing with the other hand" (Do not repeat number of fingers) *If pt is unable to move both arms, for 2nd part of command ask patient to "Add one more finger" **An error is counted if patient is unable to complete the entire command.**	Combined number of errors >1→	☐

Overall CAM-ICU		
Feature 1 plus 2 and either 3 or 4 present = CAM-ICU positive	**Criteria Met →**	☐ **CAM-ICU Positive (Delirium Present)**
	Criteria Not Met →	☐ **CAM-ICU Negative (No Delirium)**

Confusion Assessment Method for the ICU (CAM-ICU) Flowsheet



Feature 1 Specific CAM-ICU Instructions & Questions

1. Acute Change or Fluctuating Course of Mental Status:

- **Is there an acute change from mental status baseline? OR**
- **Has the patient's mental status fluctuated during the past 24 hours?**

Basics

Patients with delirium will display changes from their mental status baseline and/or fluctuation in mental status. Feature 1 assesses for these changes.

Feature 1 is present if either of the above questions is answered 'yes'.

Frequently Asked Questions for Feature 1:

1. **How do you determine baseline mental status?**

   This is the patient's **pre-hospital mental status**. Get this information from family, friends, or the H&P and document it in the patient's record to facilitate communication between staff. We encourage you to use critical thinking skills with this Feature. For example:

   - If the patient is young (e.g. <65) and is admitted from home with no documented neurocognitive disorder or history of stroke, then you could assume that the patient has a "normal" baseline mental status (i.e. alert and calm).
   - If the patient is older, has documentation of a stroke or dementia, or came from a nursing home, then you should probe family or the institution for more information on the patient's pre-hospital baseline mental status.

2. **Do you use that same 'baseline' with successive CAM-ICU assessments?**

   Always, unless a permanent change in baseline occurs (see #3). You should consistently use the patient's established pre-hospital baseline.

3. **How do you handle a permanent change of baseline during the hospitalization – i.e., a stroke or anoxic injury? Is that modified and permanent new baseline used for CAM-ICU purposes?**

   Yes. If there is a permanent change in baseline, the new baseline is used for subsequent CAM-ICU evaluations. This may be difficult to determine because of the difficulty in separating delirium from the new baseline. In practice, it is easiest to gather Feature 1 in such a situation by documenting 'fluctuations' in the mental status.

4. **Does it still count as fluctuation in mental status or change from baseline mental status when a patient is on sedatives?**

   Yes. Alteration in mental status includes those that are chemically induced by the healthcare team, including fluctuation due to titration of sedatives. This is not the patient's usual mental status. It is often difficult to completely distinguish a disease-induced change from a drug-induced change in mental status.

Feature 2 Specific CAM-ICU Instructions & Questions

2. Inattention:

- **"*Squeeze my hand when I say the letter 'A'*."**

  Read the following sequence of letters: S A V E A H A A R T
  ERRORS: No squeeze with 'A' & Squeeze on letter other than 'A'

- **If unable to complete Letters → Pictures**

Basics

Alertness is a basic arousal process in which the awake patient can respond to any stimulus in the environment. The alert, but inattentive patient will respond to any sound, movement, or event occurring in the vicinity, while the attentive patient can screen out irrelevant stimuli. ***All attentive patients are alert, but not all alert patients are attentive.***

Feature 2 is present if the patient has >2 errors.
If both tests are performed, use the Pictures to score Feature 2.

Detailed Instructions

Letters

Directions: Say to the patient, "I am going to read you a series of 10 letters. Whenever you hear the letter 'A,' indicate by squeezing my hand." Read the following 10 letters in a normal tone (loud enough to be heard over the noise of the ICU) at a rate of one letter every 3 seconds.
***Note: Patients with ICU-acquired weakness or other neuromuscular diseases may require more time to respond, or indicate response with another method (e.g., eye blinks, finger taps)**.

S A V E A H A A R T

Scoring: Errors are counted when the patient fails to squeeze on the letter "A" and when the patient squeezes on any letter other than "A."

***Attempt Letters first. If unable to complete Letters → Pictures**

Alternate: Pictures

Step 1: 5 pictures (start with the green card)
Directions: Say to the patient, "Mr. or Mrs. _____, I am going to show you pictures of some common objects. Watch carefully and try to remember each picture because I will ask what pictures you have seen." Then show Step 1 of either Packet A or Packet B, naming each item and alternating daily if repeat measures are taken. Show the first 5 pictures for 3 seconds each.

Feature 2 continued

Step 2: 10 pictures (start with the red card)
Directions: Say to the patient, “Now I am going to show you some more pictures. Some of these you have already seen and some are new. Let me know whether or not you saw the picture before by nodding your head yes (demonstrate) or no (demonstrate).” Then show 10 pictures (5 new 5 repeat) for 3 seconds each (Step 2 of Packet A or B, depending upon which form was used in Step 1 above).

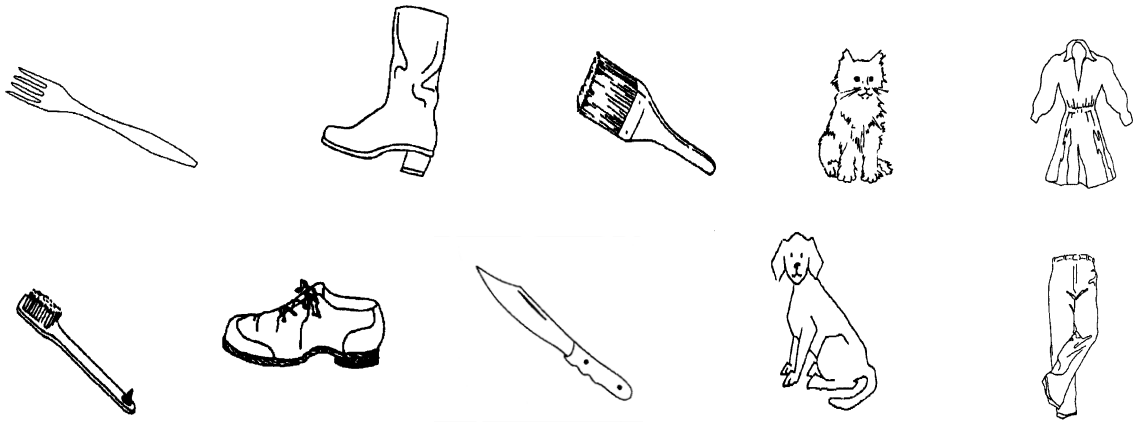
Scoring: Errors are counted with the patient incorrectly indicates ‘yes’ or ‘no’ for a picture during the second step. In order to improve the visibility for elderly patients, the images are printed on 6”x10” buff colored paper and laminated with a matte finish.

Note: If a patient wears glasses or hearing aids make sure he/she has them on.

Pictures

Step 1

Step 2



*An additional set of pictures is available on the website: http://www.icudelirium.org/assessment.html

Feature 2 continued

Frequently Asked Questions for Feature 2:

1. If a patient is RASS -3 or very lethargic, is the CAM-ICU 'unable to assess' (UTA)? Is the patient delirious?

The ability to be tested with the CAM-ICU is wholly based on a patient being at all responsive to verbal stimulation, regardless of sedative use. The 2-step approach to assess consciousness with the RASS and CAM-ICU provides a filter for the majority of patients who cannot participate in the assessment. Comatose patients (i.e., RASS -4/-5) are not tested with the CAM-ICU because they are unconscious. Though it seems like a gray zone, most patients who are a RASS -3 can provide enough data to be rated as delirious by the CAM-ICU. Some sites have used RASS -2 as the lower border for CAM-ICU rating, but most use RASS -3 as the cutoff.

- If a patient has any movement or eye opening to your voice directed to them and doesn't squeeze at all or stay awake long enough to squeeze for more than one letter, then this patient is obviously inattentive. At this point, assess the other CAM-ICU Features as needed to determine if the patient is delirious. Example:
    - If the patient ever squeezed, then count the errors (see Letters instructions).
    - If the patient never squeezed then the patient is inattentive. Also be suspicious for inattention when you have to repeat the instructions more than twice.
- One way to think about this is if there is eye opening or movement to voice, then the "lights are on". Use the CAM-ICU to see if "anyone is home".

These concepts also apply to a patient who is agitated (i.e., RASS +1 thru +4) and therefore not participating in assessment or comprehending your instructions.

2. Do you have to complete both Letters and Pictures on every patient?

No. You do not have to use both tests in each assessment. Attempt the Letters first. If the patient is able to perform this test and the score is clear, record this score and move to the Feature 3. If the patient is incapable of performing the Letters or you are unable to interpret the score, perform the Pictures. If you perform both tests, use the Pictures result to determine if the patient is inattentive. See question #1 above for interpretation of scoring. The Pictures are rarely required to assess inattention (only <5% of the time).

3. Are there other Letter sequences that I can use to assess Feature 2?

Yes. Some other sequences that have been used to assess inattention include:

- A B A D B A D A A Y (from the Pediatric CAM-ICU)
- 8 1 7 5 1 4 1 1 3 6 (Chinese traditional translation using numbers instead of letters)

4. How do I obtain Picture packets?

We will be glad to assist you in ordering the materials. Please contact us at delirium@vanderbilt.edu. Make the subject of your email "CAM-ICU order". This ensures your request is processed in a timely manner.

Feature 3 Specific CAM-ICU Instructions & Questions

3. Altered Level of Consciousness

Current RASS level

Basics

Patients with delirium experience a disturbance of consciousness and changes in cognition. For the CAM-ICU this is measured by using the RASS scale and assessing current level of consciousness. If Features 1 & 2 are absent, you do not need to proceed with this Feature.

Feature 3 is present if the patient's current level of consciousness is anything other than alert (RASS 0).

Frequently Asked Questions for Feature 3:

1. **Didn't this used to be Feature 4?**

   Yes. After other institutions began switching Features 3 & 4, we decided to switch the order for ease of use and common sense. Many users had previously gotten confused thinking the Features had to be assessed in numerical order (i.e. 1, 2, 3, 4). However, there is no rigid rule to the order of assessing CAM-ICU Features. Nothing has changed with the content of this Feature.

2. **Is Feature 3 positive in coma?**

   No. Coma is not considered delirium. Remember, we do not perform the CAM-ICU if a patient is comatose (i.e. RASS -4 or -5). Many delirious patients have recently been comatose, indicating a fluctuation of mental status. Comatose patients often, but not always, progress through a period of delirium before recovering to their baseline mental status.

3. **What is the difference between Feature 3 and Feature 1?**

   - **Feature 3 (Altered Level of Consciousness)** evaluates the patient's current level of consciousness (right now). The current level of consciousness as detected with the actual current RASS regardless of the patient's baseline mental status.
   - **Feature 1 (Acute Change or Fluctuating Course of Mental Status)** evaluates the patient's pre-hospital mental status baseline and whether there has been fluctuation in mental status during the past 24 hours.
   - **Take home point:** A patient can have an alert/calm baseline, RASS fluctuations (-1 to -2) over the past 24 hours, and currently be RASS 0. Feature 1 is present due to fluctuations, but Feature 3 is absent because the patient is currently alert (RASS 0).

4. **My facility uses a different sedation assessment scale. Can I still use the CAM-ICU?**

   Yes. Any validated sedation scale can be used for completing the CAM-ICU. The RASS is not the same as other sedation assessments, and therefore not exactly equal. For that reason, it is important to determine which values on your current sedation scale correlate with the terms and descriptions of the RASS scale. (See more details in the "Putting CAM-ICU into Practice" section, question #15, page 19)

Feature 4 Specific CAM-ICU Instructions & Questions

4. Disorganized Thinking:

1. **Will a stone float on water?**
2. **Are there fish in the sea?**
3. **Does one pound weigh more than two pounds?**
4. **Can you use a hammer to pound a nail?**

Command: "Hold up this many fingers" (Hold up 2 fingers)
"Now do the same thing with the other hand" (Do not demonstrate)
Or: "Add one more finger" (If patient is unable to move both arms)

Basics

This is the hardest area to assess in nonverbal patients because it is the most subjective of the four Features. Thought is expressed by verbal or written words. Mechanical ventilation and loss of fine motor movement limit this expressive ability in most ICU patients. Because of this, the CAM-ICU uses easy questions and a simple 2-step command to assess organization of thought. If Features 1 & 2 are absent, you do not need to proceed with this Feature.

Feature 4 is present if there is >1 error for the combined Questions + Command.

Frequently Asked Questions for Feature 4:

1. **Didn't this used to be Feature 3?**

   Yes. After other institutions began switching Features 3 & 4, we decided to switch the order for ease of use and common sense. Many users had previously gotten confused thinking the Features had to be assessed in numerical order (i.e. 1, 2, 3, 4). However, there is no rigid rule to the order of assessing CAM-ICU Features. Nothing has changed with the content of this Feature.

2. **How frequently do you have to use this Feature?**

   According to the CAM-ICU a patient is delirious if Features 1 and 2 and either 3 or 4 are present. Many times you will not need to assess this Feature because you will have the information you need from Features 1, 2, and 3. It is only when Features 1 and 2 are present and Feature 3 is absent (patient is alert) that you have to complete this Feature.

3. **If a patient answers the four questions correctly, do you still assess the command?**

   Yes. We encourage you to perform the 2-step command even if the patient scores 100% on the questions because there is a chance the patient had four lucky guesses. The combination of questions and 2-step command gives the clinician more data to make a judgment of whether there is disorganized thinking. If the patient answers all questions correctly, but the rater feels the patient randomly said yes/no, the performance on the 2-step command can help to affirm or disprove the suspicions of the clinician.

Feature 4 continued

4. Isn't there an alternate set of questions?

Yes. These questions can be used as an alternative to the set listed above. Try to alternate 'yes' then 'no' answers.

- Will a leaf float on water?
- Are there elephants in the sea?
- Do two pounds weigh more than one?
- Can you use a hammer to cut wood?

5. Is it necessary to ask all 8 questions during a CAM-ICU assessment?

No. It is only necessary to perform one set of questions for this Feature. The second set is provided as an alternate for repeated use.

6. Do you assess the 2-step command if the patient is paralyzed, quadriplegic, or visually impaired?

No. If a patient cannot move their arms or blind, score them solely on Feature 4 questions. Therefore, Feature 4 is present if the patient misses more than one question (>1 error).

7. Weren't the criteria for this Feature listed differently in your publications?

Yes. The criteria for this Feature were listed incorrectly in our publications (Ely, et al. JAMA 2001; 286:2703-2710[5] and Truman, et al CCN 2003; 23:25-36[6]). Organized thinking is evidenced by 3 or more **correct** answers to the 4 questions. Therefore, Feature 4 is present when a patient answers 2 or more of the 4 questions **incorrectly.**

Frequently Asked Questions for Putting the CAM-ICU into Practice

1. Can I use the CAM-ICU outside the Intensive Care Unit?

Although the CAM-ICU has been validated in mechanically ventilated and non-mechanically ventilated critically ill patients, it has not been validated in the non-ICU setting. Examples of delirium instruments that have been validated outside of the ICU include: the original CAM, Delirium Rating Scale (DRS-R-98), Memorial Delirium Assessment Scale (MDAS), and Nursing Delirium Screening Scale (NuDESC).

Additionally, there are the following specialty versions of the CAM-ICU:

- The Pediatric CAM-ICU (pCAM-ICU) http://www.mc.vanderbilt.edu/icudelirium/assessment_pediatric.html
- The Brief-CAM (B-CAM) for the Emergency Room - validation study currently in progress

2. Can I use the CAM-ICU in my Neuro Intensive Care Unit or in patients with Traumatic Brain Injury?

Yes, however, we must acknowledge that once there is structural brain disease, it is not always possible to determine the etiology of a patient who is CAM-ICU positive. The "delirium" or abnormal test result could be due to drugs, disease, trauma, ICH, SDH, CVA, etc. One must be careful to determine the patient's baseline and whether there is structural neurologic disease. If so, the CAM-ICU may be positive because of structural disease rather than more reversible causes of delirium. We recommend that the CAM-ICU be used in this population using the patient's last known baseline and the baseline be adjusted as more information is gained.

Once a patient is evaluated for the presence of delirium, then we must determine the cause and do whatever we can to reduce the duration of delirium. In all patients it's good to know if they are delirious or not and to monitor the trends no matter the etiology. If a patient is negative one day and positive the next, something has changed.

3. Can you perform a CAM-ICU assessment on a patient with dementia?

Yes. The features of delirium are identifiable even in the presence of dementia. In fact, we performed subgroup assessments of the CAM-ICU in patients with dementia in our validation studies (as did Dr. Inouye in her original CAM validation study). The CAM-ICU was found to be reliable and valid in patients with and without dementia. However, these patients can be more difficult to assess. Varying degrees of baseline dementia may be present, often having gone unrecognized. It is important to correctly identify the patient's baseline cognitive functional status and differentiate chronic cognitive impairments due to dementia from acute changes in attention and thinking due to delirium. A good question to ask the family to help you get this information is, "Do you think he/she could do this test at baseline?" Watching the trend is also important.

4. Can I use the CAM-ICU in patients having alcohol withdrawal?

Yes. Alcohol withdrawal can include a type of delirium which usually manifests as hyperactive delirium. The CAM-ICU can be used to detect delirium in these patients. However, it should not be used by itself as a tool to manage/guide alcohol withdrawal syndrome treatment. The ICUs at Vanderbilt use the CIWA-Ar (Clinical Institute Withdrawal Assessment for Alcohol revised), a commonly used tool in the U.S. to guide therapy for alcohol withdrawal syndrome. It is important to note that the CIWA-Ar has not been validated in ICU patients.[7, 8]

CAM-ICU evaluates patients for the presence of delirium. Then we must determine the cause and do whatever we can to reduce the duration of delirium. In all patients it's good to know if they are delirious or not and to monitor the trends no matter the etiology.

5. **How do I perform the CAM-ICU if my patient doesn't speak English?**

   The CAM-ICU is available in almost 20 languages. They can all be found at this link: http://www.icudelirium.org/assessment.html.

6. **How do you identify delirium in a patient who has a flat affect that is secondary to major depression?**

   Patients who are depressed will still exhibit features of delirium if it develops, and are assessable using the CAM-ICU. In rare cases, depression can manifest itself in a way that may cause a false positive CAM-ICU. This is because severe depression can mimic inattention and hypoactive delirium. In the majority of circumstances, a depressed patient who is found to be CAM-ICU positive is considered delirious. In general, this sort of distinction should incorporate the expertise of a psychiatrist. Watching the trend is key with these folks.

7. **When should pharmacologic treatment for delirium be discontinued?**

   Since by definition delirium is a disorder of fluctuations in mental status, a patient is considered free of delirium when CAM-ICU negative for 24 hours. If a patient was positive one shift and negative the next, continue to assess him/her for delirium and continue pharmacologic treatment initiated for delirium until the patient has been CAM-ICU negative for 24 hours. You could certainly reduce the dose of the drugs being given for delirium during that time.

8. **Is it necessary to do all four Features of the CAM-ICU assessment on every patient?**

   No. Only do the Features needed to get your answer. Remember a patient is considered delirious (i.e. CAM-ICU positive) when Features 1 and 2 and either Feature 3 or 4 are present. For example:

   - If Features 1, 2, & 3 are present, then there is no need to assess Feature 4.
   - If either Features 1 or 2 are absent then you do not have to proceed because the patient cannot be CAM-ICU positive without them.

9. **How frequently should patients be assessed for delirium using the CAM-ICU?**

   We recommend that critically ill patients be assessed for delirium with the CAM-ICU at least once per nursing shift (every 8-12 hours). Some ICUs do this more often, and especially with changes in the patient's clinical status.

10. **My patient does not meet the Features to be CAM-ICU positive, but still acting like he/she is delirious. What does this mean?**

    It is possible for patients to never develop all the symptoms of delirium required by the DSM-IV criteria for clinical diagnosis. When a patient exhibits only some of the symptoms of delirium it is considered subsyndromal delirium. This intermediate form of delirium is associated with prolonged ICU and hospital length of stay compared to those who never experience delirium.[9]

11. Do you have to perform the Features in succession at the bedside?

No. However, when thinking of implementing the CAM-ICU into bedside practice or for research purposes, it is important to consider that many of its components are often already used in practice (i.e., staff are usually assessing for Feature 1 via sedation scales or other neurologic assessments). A thorough evaluation of the current bedside assessment components will help identify which CAM-ICU Features are already being assessed.

An examination of your current ICU practice will also help to modify some parts of the current assessment to accurately identify delirium. We recommend incorporating the CAM-ICU Features into your regular physical assessment. The raw data are collected throughout the patient assessment and then plugged in to the CAM-ICU algorithm to discern for the presence or absence of delirium.

12. How should I document the CAM-ICU?

The first step of adaptation is to decide where the results will be documented. We recommend documenting the CAM-ICU in the hourly portion of the nursing flowsheet. Most institutions document the overall CAM-ICU score and not the individual Features. However, if you have room, the individual Feature documentation can help with compliance and accuracy of the overall assessment and provide excellent data for chart review when trying to identifying weaknesses in the assessment.

Once you have decided where to document the CAM-ICU findings, the next step is to identify what language you would like to use for the documentation. We have found that different institutions choose to record the overall CAM-ICU as either "positive" or "negative" OR "Yes", "No" and "UTA." It is important to note that UTA really means that you were unable to assess delirium because the patient's level of consciousness was too deep to assess content of consciousness. In other words, UTA = coma/stupor instead of delirium or normal. The table below shows the various terminologies that have been used. We recommend picking the language that your staff best understands.

Overall CAM-ICU score			
Yes	Positive	Present	Delirious
No	Negative	Absent	Not Delirious
UTA*	UTA*	UTA*	UTA*

*UTA = unable to assess

13. Should I do a CAM-ICU assessment before, during, or after a Spontaneous Awakening Trial (SAT)?

Before. We recommend doing the CAM-ICU assessment before the SAT (e.g. daily sedation cessation, which is the turning off of sedation to allow the patient to awaken) is started as a baseline assessment. You can always assess again after the SAT is started. It can be tricky to have a protocol that says to do the CAM-ICU after drugs have been held because patients wake up at varying speeds, and it lacks good clinical info. Some patients wake up after 15 minutes, while others may take hours.

It is good practice to do a second CAM-ICU assessment just before the SBT (spontaneous breathing trial)/CPAP trial or when the patient begins to act different, and you think the answer has changed. Try to maintain consistency by having the same person perform the CAM-ICU and the SAT (initiation/evaluation).

14. How can I determine if my staff is performing the CAM-ICU correctly?

We suggest conducting a CAM-ICU competency. This is a great way to identify misunderstandings with the CAM-ICU as well as provide an opportunity to teach about delirium. This periodic competency could include assessment case studies, delirium facts, and spot checks with CAM-ICU experts. There are spot checking details and a form available on our website at: http://www.icudelirium.org/assessment.html. Spot checking provides an excellent opportunity to educate regarding mistakes and misconceptions.

15. The CAM-ICU was validated with the RASS, but my hospital uses a different sedation scale. Can I use a different sedation scale with the CAM-ICU? (i.e. SAS [Riker Sedation-Agitation Scale]**, Ramsay, MAAS** [Motor Activity Assessment Scale]**)**

Yes. The CAM-ICU was originally validated using the RASS, but any validated sedation scale can work for evaluating the level of consciousness for the purpose of CAM-ICU assessment. The RASS is not the same as other sedation assessments and therefore the number schematic will be different. For that reason, it is important to determine which values on your current sedation scale correlate with the terms and descriptions of the RASS scale. The problem with some sedation scales is the mix of verbal and physical stimulation at the same level. This makes it difficult to distinguish the key feature that allows someone to be assessable for delirium—response to verbal stimulation. For example:

MAAS	RASS
0	-5
1	-4
2	-4, -3, -2, -1
3	0
4	+1
5	+2, +3
6	+4

OR

Ramsay	RASS
1	+1, +2, +3, +4
2	-1, 0
3	-3, -2, -1
4	-4, -3, -2, -1
5	-4, -3, -2, -1
6	-5

OR

SAS	RASS
7	+4
6	+3
5	+2, +1
4	0
3	-3, -2, -1
2	-4
1	-5

16. How do I obtain copyright permission?

We have obtained copyright for the CAM-ICU and its educational materials and have deliberately made it unrestricted in terms of use. We ask that you include the copyright line on the bottom of the pocket cards and other educational materials, but do not require you to obtain a written letter of permission for implementation and clinical use.

Copyright line: “Copyright © 2002, E. Wesley Ely, MD, MPH and Vanderbilt University, all rights reserved”

For information on the copyright for the original CAM, please refer to the following website: www.hospitalelderlifeprogram.org

17. How do I obtain Picture Packets and/or Pocket Cards?

We will be glad to assist you in ordering the materials. Please contact us at delirium@vanderbilt.edu. Please make the subject of your email “CAM-ICU order”. This will ensure that your request is processed in a timely manner.

18. Where can I learn more about ICU delirium and the CAM-ICU?

Check out our website: www.icudelirium.org. The site includes lots of helpful links for references, training videos, protocols, patient & family education, etc. Also, feel free to contact our team at delirium@vanderbilt.edu.

19. How can I arrange for in-person training?

Several members of our staff are available for doing onsite delirium teaching and/or CAM-ICU training at your institution. Additionally we periodically host CAM-ICU training workshops at Vanderbilt. If you are interested in any of this teaching, please contact us at delirium@vanderbilt.edu.

Case Study # 1:

Mrs G. is a 65 y/o admitted for acute respiratory failure. She lives independently in her own home, is active in her church, and still drives herself everywhere. You walk into the room and she looks at you immediately. She appears anxious as she is being ventilated with BIPAP. Her arms are restrained and she is pulling at them to get her BIPAP mask off. Her lowest RASS in the previous 24 hours was –2, and highest RASS was +2. She scored 5 on the Letters of Feature 2. She answers 2 questions correctly and follows the commands of Feature 4.

STEP 1 - RASS

What is her current RASS Score? ____

Proceed with Step 2 – CAM-ICU assessment?

☐ **Yes** (it is possible to assess delirium at this level)
☐ **No** (the patient is too deep to assess content of consciousness)

STEP 2 - CAM - ICU

Feature 1: Acute Change or Fluctuating Course of Mental Status

Is there an acute change from mental status baseline? Yes ☐ No ☐

Has mental status fluctuated during the past 24 hours? Yes ☐ No ☐

Feature 1: Present ☐ Absent ☐

Proceed with Feature 2? Yes ☐ No ☐

Feature 2: Inattention

Letters > 2 Errors: Yes ☐ No ☐

Pictures > 2 Errors: Yes ☐ No ☐ Not needed ☐

Feature 2: Present ☐ Absent ☐

Proceed with Feature 3? Yes ☐ No ☐

Feature 3: Altered Level of Consciousness

Current RASS (Think back to sedation assessment in Step 1)

Feature 3: Present ☐ Absent ☐

Proceed with Feature 4? Yes ☐ No ☐

Feature 4: Disorganized Thinking

Combined number of Errors > 1 Yes ☐ No ☐

Feature 4: Present ☐ Absent ☐

Overall CAM-ICU:

☐ **Positive (Feature 1 and 2 and either 3 or 4 present)**
☐ **Negative**

Answers provided on page 25

Case Study # 2:

Your 80 y/o patient was successfully weaned from the ventilator and extubated at 0800 after abdominal surgery. He is alert and calm since all sedation and analgesia had been stopped earlier in the morning. Yesterday evening and last night he had periods of agitation with a documented RASS of -1 to +3. He lives with family due to physical limitations with mobility but is still cognitively intact. He correctly answers all the questions and is able to identify the number of fingers the interviewer holds up and follows the command. He squeezes correctly on all the letters.

STEP 1 - RASS

What is her current RASS Score? ____

Proceed with Step 2 – CAM-ICU assessment?

☐ **Yes** (it is possible to assess delirium at this level)
☐ **No** (the patient is too deep to assess content of consciousness)

STEP 2 - CAM - ICU

Feature 1: Acute Change or Fluctuating Course of Mental Status

Is there an acute change from mental status baseline? Yes ☐ No ☐

Has mental status fluctuated during the past 24 hours? Yes ☐ No ☐

Feature 1: Present ☐ Absent ☐

Proceed with Feature 2? Yes ☐ No ☐

Feature 2: Inattention

Letters > 2 Errors: Yes ☐ No ☐

Pictures > 2 Errors: Yes ☐ No ☐ Not needed ☐

Feature 2: Present ☐ Absent ☐

Proceed with Feature 3? Yes ☐ No ☐

Feature 3: Altered Level of Consciousness

Current RASS (Think back to sedation assessment in Step 1)

Feature 3: Present ☐ Absent ☐

Proceed with Feature 4? Yes ☐ No ☐

Feature 4: Disorganized Thinking

Combined number of Errors > 1 Yes ☐ No ☐

Feature 4: Present ☐ Absent ☐

Overall CAM-ICU:

☐ **Positive (Feature 1 and 2 and either 3 or 4 present)**
☐ **Negative**

Answers provided on page 25

Case Study # 3:

You enter the room of a 65 y/o patient you enrolled 2 days ago after she had emergency abdominal surgery. She is still on the ventilator, her eyes are closed, she does not open her eyes to verbal stimuli but does respond to physical stimuli. She was on paralytics and has been off them for 24 hours. She is still receiving sedatives. She has been RASS -5 to -2 over the past 24 hours. She is unable to follow any commands. Prior to surgery she had just retired from her teaching job.

STEP 1 - RASS

What is her current RASS Score? ____

Proceed with Step 2 – CAM-ICU assessment?

☐ **Yes** (it is possible to assess delirium at this level)
☐ **No** (the patient is too deep to assess content of consciousness)

STEP 2 - CAM - ICU

Feature 1: Acute Change or Fluctuating Course of Mental Status

Is there an acute change from mental status baseline? Yes ☐ No ☐

Has mental status fluctuated during the past 24 hours? Yes ☐ No ☐

Feature 1: Present ☐ Absent ☐

Proceed with Feature 2? Yes ☐ No ☐

Feature 2: Inattention

Letters > 2 Errors: Yes ☐ No ☐

Pictures > 2 Errors: Yes ☐ No ☐ Not needed ☐

Feature 2: Present ☐ Absent ☐

Proceed with Feature 3? Yes ☐ No ☐

Feature 3: Altered Level of Consciousness

Current RASS (Think back to sedation assessment in Step 1)

Feature 3: Present ☐ Absent ☐

Proceed with Feature 4? Yes ☐ No ☐

Feature 4: Disorganized Thinking

Combined number of Errors > 1 Yes ☐ No ☐

Feature 4: Present ☐ Absent ☐

Overall CAM-ICU:

☐ **Positive (Feature 1 and 2 and either 3 or 4 present)**
☐ **Negative**

Answers provided on page 26

Case Study # 4:

You enter the room of a 78 y/o cardiac patient you have been seeing over several days. She lives at home and cares for her husband. She has been RASS -1 to 0 and CAM-ICU negative for the past 48 hours. She is RASS 0 this morning and greets you by saying "How do you think I look?" You exchange pleasantries about how she is doing today. She answers 2 questions correctly, follows commands but gets 6 letters and 5 pictures correct.

STEP 1 - RASS

What is her current RASS Score? ____

Proceed with Step 2 – CAM-ICU assessment?

☐ **Yes** (it is possible to assess delirium at this level)
☐ **No** (the patient is too deep to assess content of consciousness)

STEP 2 - CAM - ICU

Feature 1: Acute Change or Fluctuating Course of Mental Status

Is there an acute change from mental status baseline? Yes ☐ No ☐

Has mental status fluctuated during the past 24 hours? Yes ☐ No ☐

Feature 1: Present ☐ Absent ☐

Proceed with Feature 2? Yes ☐ No ☐

Feature 2: Inattention

Letters > 2 Errors: Yes ☐ No ☐

Pictures > 2 Errors: Yes ☐ No ☐ Not needed ☐

Feature 2: Present ☐ Absent ☐

Proceed with Feature 3? Yes ☐ No ☐

Feature 3: Altered Level of Consciousness

Current RASS (Think back to sedation assessment in Step 1)

Feature 3: Present ☐ Absent ☐

Proceed with Feature 4? Yes ☐ No ☐

Feature 4: Disorganized Thinking

Combined number of Errors > 1 Yes ☐ No ☐

Feature 4: Present ☐ Absent ☐

Overall CAM-ICU:

☐ **Positive (Feature 1 and 2 and either 3 or 4 present)**
☐ **Negative**

Answers provided on page 26

Answers for Case Studies

Case #1	
Feature 1: Acute Change or Fluctuating Course of Mental Status	
RASS has been -2 to +2 over the past 24 hours. She lived independently at home prior to hospitalization.	**present**
Feature 2: Inattention	
She is restless and has >2 errors on Letters and Pictures	**present**
Feature 3: Altered Level of Consciousness	
She is restrained and anxious and trying to pull the BIPAP mask off with a RASS of +3	**present**
Feature 4: Disorganized Thinking	
She answers 2 questions correctly and does complete 2-step command with combined number of errors >1.	**Present**
OVERALL CAM-ICU	**POSITIVE**

Case #2	
Feature 1: Acute Change or Fluctuating Course of Mental Status	
Although he is at his mental status baseline, RASS has been -1 to +3 over the last 24 hours	**present**
Feature 2: Inattention	
He had zero errors with Letters, no need to do the Pictures	**absent**
Feature 3: Altered Level of Consciousness	
Current RASS is 0, he is alert and calm	**absent**
Feature 4: Disorganized Thinking	
He answers all questions correctly and does complete 2-step command with zero combined errors.	**absent**
OVERALL CAM-ICU	**NEGATIVE**

Case Study #3	
Feature 1: Acute Change or Fluctuating Course of Mental Status	
RASS has been -5 to -2 over the past 24 hours and she is no longer on paralytics but is still on sedatives. She is currently unresponsive to verbal stimulation.	
Feature 2: Inattention	
She only responds to physical stimuli—unable to assess (UTA)	
Feature 3: Altered Level of Consciousness	
Current RASS is -4, she only responds to physical stimuli	
Feature 4: Disorganized Thinking	
She only responds to physical stimuli – unable to assess (UTA)	
OVERALL CAM-ICU	**UTA -** Remember we cannot assess CAM-ICU when a patient is RASS -4 or -5

Case Study #4	
Feature 1: Acute Change or Fluctuating Course of Mental Status	
She is RASS 0 today and RASS has been -1 - 0 for the past 48 hours and her mental status baseline *appears* unchanged. She lives at home and takes care of her husband.	**present**
Feature 2: Inattention	
She got >2 errors with Letters and Pictures	**present**
Feature 3: Altered Level of Consciousness	
Current RASS is 0, alert and calm	**absent**
Feature 4: Disorganized Thinking	
She answers 2 questions correctly and does complete 2-step command with combined number of errors >1.	**present**
OVERALL CAM-ICU	**POSITIVE**

ROAD MAP FOR INTERDISCIPLINARY COMMUNICATION

Skipping any of these steps could leave the clinical team wanting more information!

Screening – Investigate the following:

1. Where is the patient going? (i.e., sedation targets/goals)
2. Where is the patient now? (i.e., current RASS/CAM-ICU)
3. How did they get there? (i.e., drug exposures)

Presenting– State the following (only takes 10 seconds!):

1. **Target RASS**
2. **Actual RASS**
3. **CAM-ICU**
4. **Drugs**

T. H. I. N. K. about Delirium

Delirium recognition is like a burglar alarm for us. It forces us to consider identifiable, treatable causes earlier, and prevents knee-jerk treatment.

Toxic Situations: CHF, shock, dehydration, deliriogenic meds, new organ failure (liver, kidney)

Hypoxemia; or consider giving **H**aloperidol or other atypical antipsychotics

Infection/sepsis, **I**nflammation, **I**mmobilization, or is there a new nosocomial **I**nfection?

Nonpharmacologic interventions: Ambulation/physical therapy, hearing aids, visual aids (glasses), reorientation, sleep hygiene, music, noise control

K^+ or other electrolyte and metabolic problems

Example ICU patient with ARDS

Day 1: **Target RASS** -4, on 70% oxygen/PEEP 14, **actual RASS** +1 to -1 (bucking vent & desaturating), **CAM-ICU** +, intermittent bolus benzodiazepines and fentanyl

Patient is under-sedated in ARDS, best approach would be to increase drug delivery

Day 2: **Target RASS** -1**,** on 40% oxygen/PEEP 6, **actual RASS** -3, **CAM-ICU** +, on propofol drip

Patient is over-sedated and delirious, lighten or stop sedation if appropriate– using "Wake Up and Breathe" or "ABC approach" (Girard T. et al, Lancet 2008)

Day 3: **Target RASS** 0**,** actual **RASS** 0, **CAM-ICU** +, off sedation and analgesia since last night.

Patient is delirious and off sedation… Why??? See T. H. I. N. K. above

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