Assessment for Delirium:  
*Overview and the Confusion Assessment Method (CAM)*

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Delirium Recognition

• Recognition is challenging!
  – Fluctuating course with lucid intervals
  – Different forms: hypoactive 75% (worse prognosis)/hyperactive or mixed 25%
  – Concurrence with dementia (up to 50%)
  – Easily overlooked

• Decreased LOC: prevalence varies across settings (highest in ICU, PACU)

• Hallucinations, delusions rare: 10-15%

Assessment for Delirium

• Many methods currently exist
• Important to distinguish between:
  – Diagnostic evaluation (reference standard rating)
  – Delirium screening

• A continuum exists between these extremes
• Setting also matters:
  – Clinical vs. Research
  – Outcomes study vs. Phase I treatment trial
Reference Standard Diagnosis

- Experienced clinician (geriatric psychiatrist, geriatrician, neurologist)
- Based on fulfillment of accepted diagnostic criteria (DSM-IV or DSM5; ICD-10)
- No accepted assessment or methodology
- Usually involves patient assessment, review of medical record, family input

Standardized Delirium Tests

- Confusion Assessment Method (CAM)
- CAM for the Intensive Care Unit (CAM-ICU)
- 3-Minute Diagnostic Interview for CAM delirium (3D-CAM)
- Intensive Care Delirium Screening Checklist (ICDSC)
- Delirium Index (DI)
- Delirium Observation Screening Scale (DOSS)
- Delirium Rating Scale (DRS)-Revised-98
- Delirium Symptom Interview (DSI)
- Memorial Delirium Assessment Scale (MDAS)
- Neelon/Champagne Confusion Scale (NEECHAM)
- Nursing Delirium Screening Scale (NuDESC)

...and more
Focus on Confusion Assessment Method (CAM)

- Most widely used method worldwide
- Used in >4000 original studies to date, translated into over 20 languages
- Short CAM (4-item)—diagnostic algorithm only
- Long CAM (10-item):
  - provides more information on phenotypes, severity
  - can serve as reference standard in research studies
- Our training today will focus on the Long CAM
- Also feature the 3D CAM—a new standardized interview that operationalizes the Short CAM

Confusion Assessment Method

- Developed in 1988, since no validated instrument for delirium existed at that time
- Designed to enable nonpsychiatric clinicians to detect delirium quickly and accurately
- Based on DSM-IIIR criteria (11 criteria)—simplified and operationalized criteria and developed diagnostic algorithm. Extrapolates well to DSM5
- Copyrighted instrument. Free of charge for all nonprofit clinical, educational, academic research purposes with acknowledgement:
The CAM Diagnostic Algorithm

(1) acute onset and fluctuating course  
   -and-  
(2) inattention  
   -and either-  
(3) disorganized thinking  
   -or-  
(4) altered level of consciousness

In over 7 validation studies (N>1000 patients), CAM highly sensitive (94%) and specific (89%) when used by trained individuals.


The CAM Diagnostic Process

Formal interview with patient  
(cognitive testing +/- family and nurse involvement)  

Use interview to score the CAM long form  
(10 Items)  

Use scores from CAM long form to complete the CAM short form algorithm  
(4 items)  

RESULT: Delirious/Non-Delirious
Cognitive testing

- The CAM must be scored based on observations made during an interview including formal cognitive assessment
- The assessment can be brief (1-2 mins), but should include: orientation, attention, memory
- Common tests used: SPMSQ, Mini-Cog, digit span, DOWB, MOYB, 3D-CAM

General Interview Guidelines

- Remember observe all respondent behavior
  - Score CAM based not only on cognitive testing, but also any observations during consent, conversation, and other parts of interview
  - Build knowledge of patient’s general mental status

- (Ideal) Setting
  - Aim to create a quiet, calm environment
    - Close door, turn off television, etc.
  - Reduce likelihood of interruption
    - Communicate with nursing
**General Interview Guidelines**  
(cont)

• Technique
  – Write a lot of notes
    • Patient’s exact responses
    • Patient behavior
    • Use the lines on the page to write detailed descriptions
  – Be sure to maintain patient’s attention and enunciate
  – Devices for hearing impaired such as Pocket Talker can be used
  – Do not give verbal praise, or indicate correct/incorrect answer
  – Probe for details!!

**General Interview Guidelines**  
(cont)

• Record patient’s exact words where possible
• Do not give your interpretation of behaviors, but rather detail the exact behavior observed:
  – Instead of “respondent disoriented”, write “respondent said she was on a ship in Hawaii”.
  – Instead of “respondent seems inattentive”, write: “could not make eye contact, attention darted to every noise in room”.
**CAM – Acute Change**

*Is there evidence of an acute change in mental status from the patient’s baseline?*

- Positive if the patient demonstrates or reports a change in mental status
- Must establish the baseline
- Either new in onset or worsening in intensity, usually over hours to days
- Evidence may come from the interview (patient self-report), medical record, nurse/MD, comments from family or visitors.

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**CAM - Fluctuation**

*Did this behavior fluctuate during the interview?*

- Key items to observe for fluctuation
  - Inattention
  - Disorganized thinking
  - Altered Level of Consciousness
  - Psychomotor Agitation
  - Psychomotor Retardation
- Scored based on fluctuation during the interview (i.e., symptom *comes and goes* or *increases and decreases* in severity)
Mild vs. Marked CAM Symptoms

• “Mild” rating means:
  – behavior was present or observed
  – did not significantly interfere with the interview
• “Marked” rating means:
  – behavior was present or observed
  – did significantly interfere with the interview
    process (e.g., interview difficult, interrupted, or prolonged).

CAM - Inattention

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

• Reduced ability to maintain attention to external stimuli and to shift attention to new stimuli.
• Respondent unaware or out-of-touch with environment (e.g., dazed, fixated, or darting attention); no eye contact
• Difficult to establish back and forth conversation
• Errors on attention tests or needs directions repeated
**CAM – 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?

- Patient speaks incoherently, rambles, irrelevant conversation, tangential or circumstantial speech, faulty reasoning
- Off-target or nonsense responses
- Must be able to speak to assess this feature

**CAM – Altered level of consciousness**

*Overall, how would you rate this patient’s level of consciousness?*

- Vigilant (Hyperalert, overly sensitive to stimuli, startles easily)
- Lethargic (Drowsy, easily aroused)
- Stupor (Difficult to arouse)
- Coma (Unarousable)
- Important to distinguish from psychomotor agitation or retardation
  - LOC refers to level of arousability or responsiveness
  - Psychomotor agitation/retardation characterizes nature of responses to stimuli (hyperactive vs. delayed, etc)
CAM – Altered level of consciousness
(Scoring)

- May need to wake patient up to start interview – this is a “freebie” even if it’s difficult to fully wake them
  - Do not count this when determining level of consciousness
- Scoring
  - Vigilant: Hyperaware of environmental stimuli
  - Alert (normal): Patient awake throughout interview, does not require any arousal
  - Lethargic: Patient falls asleep during interview but is awakened easily to voice
  - Stupor: Patient falls asleep during interview and requires repeated shaking and/or shouting to arouse
  - Coma: patient is unarousable despite shaking/shouting
- Important to note fluctuation

CAM - Disorientation

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?

- Inability to locate oneself in the environment with reference to time, place, person
- Thinks she is at home, or that it is night-time during the day
- Errors on orientation questions
CAM – 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?

- Inability to learn new material or to remember past or recent events.
- Cannot recall why or how long in the hospital, or how many children s/he has
- Errors on recall tasks

CAM – 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)?

- Interviewer must either witness this feature during the interview or patient reports it within past 24 hours
- Present if patient describes visual, auditory, tactile, olfactory hallucinations or perceptual disturbances, or appears to be responding to such stimuli
- Sensory misperception from false impression of actual stimulus; hallucination when no stimulus is present
CAM – Psychomotor Agitation

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?

- Greatly increased activity compared with norm
- Indicate restlessness or agitation
- Fidgeting, tapping, excessive shifting of position, pacing
- Increased speed of response
- Repetitive movements (grasping, picking behaviors)
- May be voluntary or involuntary

CAM – Psychomotor Retardation

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?

- Reduced activity compared to the norm
- Sluggishness, slowing
- Decreased activity/movement, decreased speed of movements or speech, delayed motor or verbal responses
- May be voluntary or involuntary
CAM – Sleep-wake cycle disturbance

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

- Any deviation from the patient’s normal sleep-wake cycle.
  - Self-reports of sleeping difficulties (e.g., insomnia or hypersomnolence)
  - Reversal of cycle (e.g., frequent napping during day and insomnia at night)

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The CAM Diagnostic Process

1. **Formal interview with patient** (cognitive testing +/- family and nurse involvement)
2. Use interview to score the CAM long form (10 Items)
3. Use scores from CAM long form to complete the CAM short form algorithm (4 items)
4. **RESULT:** Delirious/Non-Delirious
Training and Standardization Procedures

- Practice interviews with experienced interviewer
- Pilot interviews on floor with delirious and non-delirious patients, with feedback
- Inter-rater reliability assessments with 5 delirious and 5 non-delirious; achieve 100% agreement
- Ongoing coding sessions with interviewers to discuss questions once a month. Many coding discrepancies need to be handled locally to get team consistent. Record decisions (Ops Manual)

CAM-S Severity Scoring

- Simple additive score based on delirium symptoms.
- For 4-item CAM, scored from 0-7.
- For 10-item CAM, scored 0-19.
  – Detailed scoring instructions at: [www.hospitalelderlifeprogram.org](http://www.hospitalelderlifeprogram.org)
- CAM-S score strongly associated with poor clinical outcomes (LOS, costs, placement, functional/cognitive decline, death)

**Delirium Episode Severity**

- Quantifies severity and course of delirium over an entire hospitalization
- Found that measures that incorporate BOTH intensity and duration were the best predictors of post-hospital outcomes at 30- and 90- days
- Sum of all CAM-S scores and Peak CAM-S were the preferred measures

Vasunilashorn SM. JGIM 2016; 31:1164-71

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**Why is delirium severity important?**

- Any time a continuous measure needed to track change over time
- Response to treatment
- Monitor clinical course and recovery
- Track burden of care, service utilization
- Advance pathophysiologic understanding and mechanisms
Other CAM measurement approaches

• 3D-CAM—will be covered tomorrow
• FAM-CAM—validated proxy-based approach

[Tools and training videos available without charge at: www.HospitalElderLifeProgram.org]

Chart-based approaches

• Validated chart review approach (Inouye, 2005)—trained abstractor and adjudication
• Combination of once daily CAM and chart review most sensitive approach and provides 24 hour perspective (Saczyński 2014)

[All available without charge at: www.HospitalElderLifeProgram.org]
I’ve seen a dying eye
Run round and round a room
In search of something, as it seemed,
Then cloudier become;
And then, obscure with fog,
And then be soldered down,
Without disclosing what it be,
‘Twere blessed to have seen.

*Emily Dickinson*