

# **CEDARTREE Bootcamp: 3D-CAM Training**

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## **What is 3D-CAM?**

- Stands for: 3 Minute Diagnostic Interview for CAM-defined Delirium
- Short, structured assessment that operationalizes the CAM diagnostic algorithm

## CAM Diagnostic Algorithm

- (1) Acute Change or Fluctuating Course  
-and-
- (2) Inattention  
-and either-
- (3) Disorganized Thinking  
-or-
- (4) Altered Level of Consciousness

Should be performed AFTER cognitive testing

Ref: Inouye SK, et. al. Ann Intern Med. 1990, 113: 941-8

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## How was 3D-CAM created?

- Started with over 160 items
  - Mapped to 4 CAM diagnostic features
- Used Item Response Theory (IRT) to identify most informative items
- Used model selection methods to further reduce items

Yang et. al., BMC Res Meth, 2013

## Final Instrument

- Patient Questions: 3 Orientation Items, 4 Attention Items, 3 Symptom Probes
- Observational Items: Altered LOC, Fluctuation, Inattention, Disorganized Thinking
- Any 1 “Positive” Item triggers the Feature
- CAM algorithm: determines the presence or absence of delirium

## Validation Study

- Performed in 201 Gen Med Patients, avg. age 84, 28% with dementia
- All patients received:
  - Reference Standard Assessment
  - 3D-CAM blinded to ref standard
- Results: 95% sensitivity, 94% specificity
  - Retains excellent performance in patients with dementia

Marcantonio et. al., Ann Int Med, 2014

## 3D-CAM-S

- Method of scoring delirium severity using the 3D-CAM items
  - Replicates the CAM-S severity score
  - Requires no additional questions
  - Uses results from objective testing within the 3D-CAM to rate each CAM feature: 0, 1, 2

Vasunilashorn et. al., JAGS, 2016

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## Administering the 3D-CAM

### General Instructions:

- Unable to assess: use sparingly
- Coding Instructions: Incorrect/Yes also includes “I don’t know” and No response or nonsense responses.
- Complete Items 1-20 on all patients (i.e. do not use skip patterns)

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## Feature 3 Questions

- Can you tell me the year we are in right now?
- Can you tell me what is the day of the week?
- Can you tell me what type of place is this?  
[hospital]

Any incorrect response triggers CAM Feature 3 (Disorganized Thinking).

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## Feature 2 Questions

- Digit Span backwards: I am going to read you some numbers. I want you to repeat them in backwards order...
  - The first is 7-5-1 [1-5-7]
  - The second is 8-2-4-3 [3-4-2-8]
- Can you tell me the days of the week backwards, starting with Saturday?
- Can you tell me the months of the year backwards, starting with December?

Any incorrect response triggers CAM Feature 2 (Inattention).

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## Feature 1 Questions

- During the past day have you felt confused?
- During the past day did you think that you were really not in the hospital?
- During the past day did you see things that were not really there?

Any “Yes” response triggers CAM Feature 1 (Acute Change).

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## Feature 4 Observations

- Was the patient sleepy during the interview?  
(falls asleep, but easy to arouse)
- Was the patient stuporous or comatose during the interview (difficult/impossible to arouse)?
- Did the patient show hypervigilance, such as having inappropriately strong responses to ordinary objects/stimuli in the environment?

Any “Yes” response triggers CAM Feature 4 (Altered Level of Consciousness).

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## **Feature 3 Observations**

- Was the patient's flow of ideas unclear or illogical?
- Was the patient's conversation rambling (e.g. inappropriately verbose, off-target)?
- Was the patient's speech unusually limited or sparse (e.g. yes/no answers)?

Any "Yes" response triggers CAM Feature 3 (Disorganized Thinking).

## **Feature 2 Observations**

- Did the patient have trouble keeping track of what was being said during the interview?
- Did the patient appear inappropriately distracted by environmental stimuli?

Any "Yes" response triggers CAM Feature 2 (Inattention).

## Feature 1 Observations

- Did the patient's level of consciousness fluctuate during the interview?
- Did the patient's level of attention fluctuate during the interview?
- Did the patient's speech/thinking fluctuate during the interview?

Any "Yes" response triggers CAM Feature 1 (Fluctuating Course).

## Feature 1 Optional Questions

**To be completed only if Feature 1 is not checked but Feature 2 and either 3 or 4 are checked**

- Consult medical record, healthcare provider, or family member: "Is the patient experiencing an acute change in their memory or thinking?"
- After baseline: Review previous 3D-CAM's. Are there any NEW "positive" items?

Any "Yes" response triggers CAM Feature 1 (Acute Change).



## Remember: CAM Ratings

- Start when you enter the room
- End when you leave the room
- Integrate:
  - Performance on formal cognitive testing
  - Observations of LOC, focus, quality of speech, fluctuations, etc.

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## Video Time!



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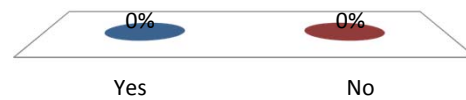
# DAY 1

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## 11A. Sleepy?

A. Yes

★ B. No



### 11B. Stuporous/Comatose?

A. Yes

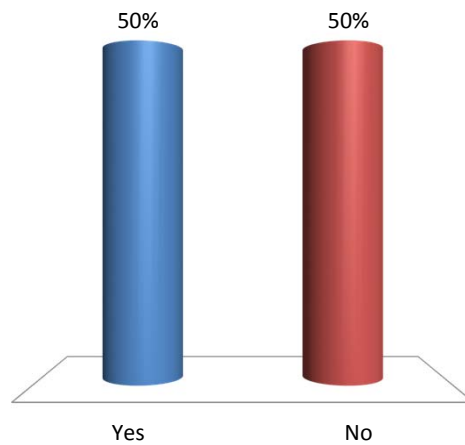
★ B. No



### 12. Hypervigilant?

A. Yes

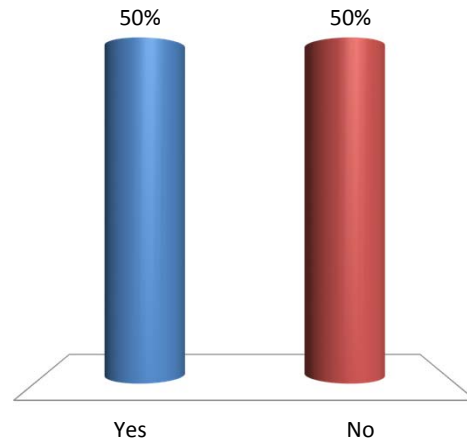
★ B. No



### Flow of ideas unclear or illogical?

A. Yes

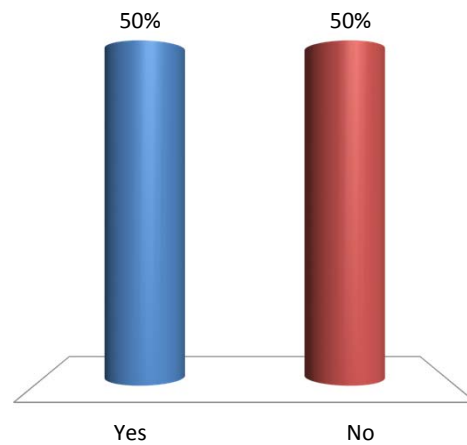
★ B. No



### 14. Conversation rambling?

A. Yes

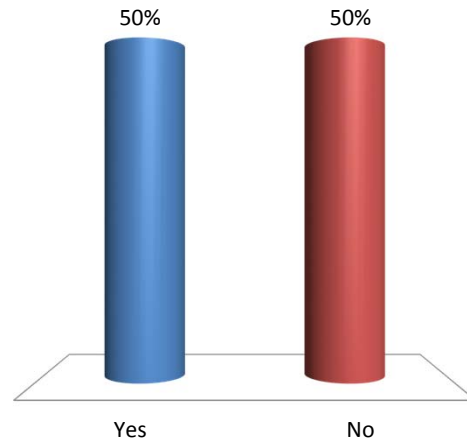
★ B. No



### 15. Speech limited or sparse?

A. Yes

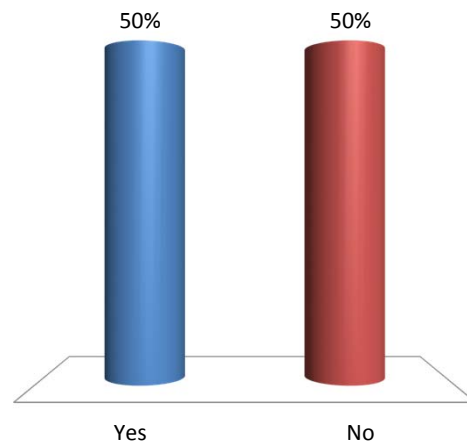
★ B. No

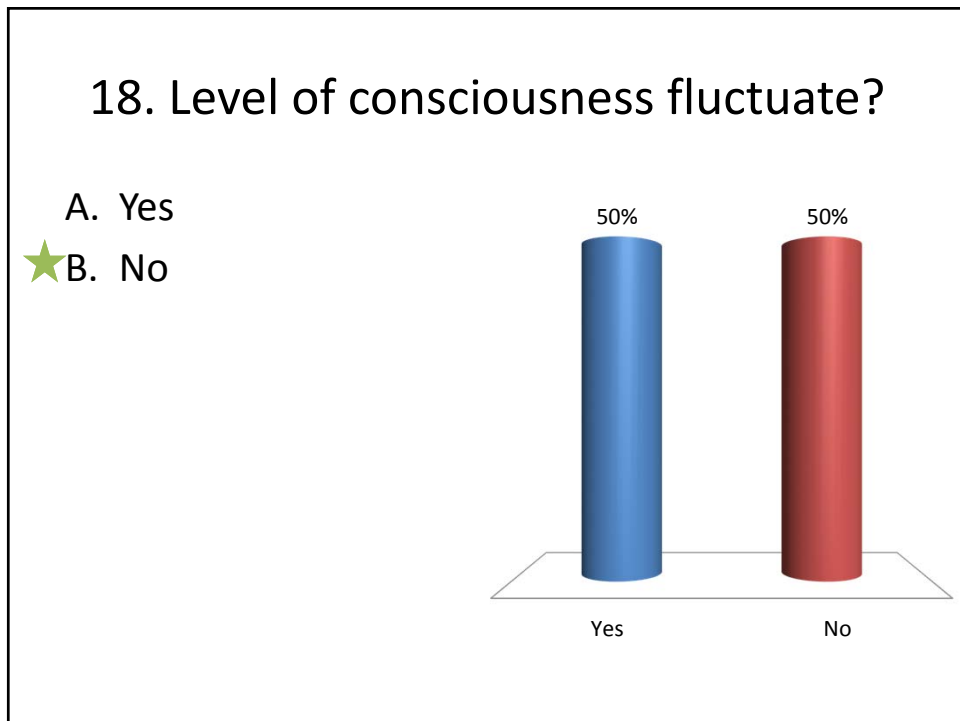
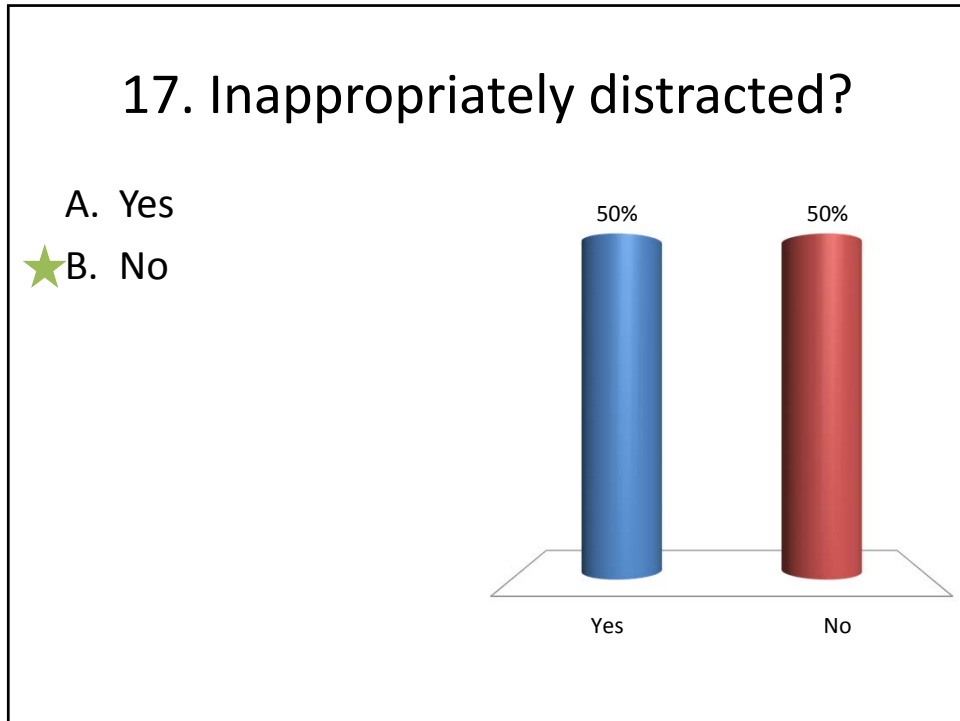


### 16. Trouble keeping track?

A. Yes

★ B. No

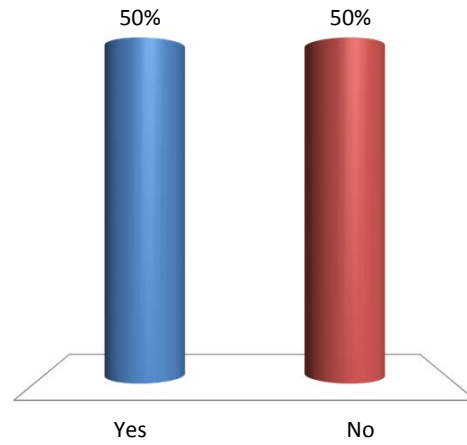




### 19. Level of attention fluctuate?

A. Yes

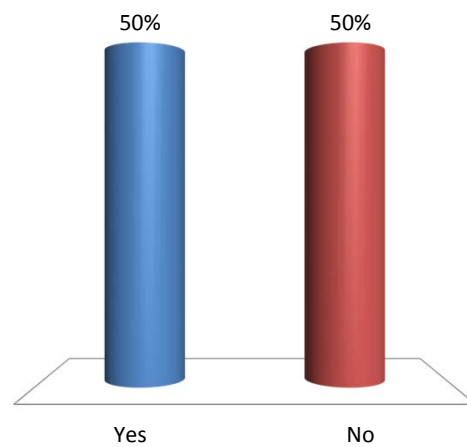
★ B. No

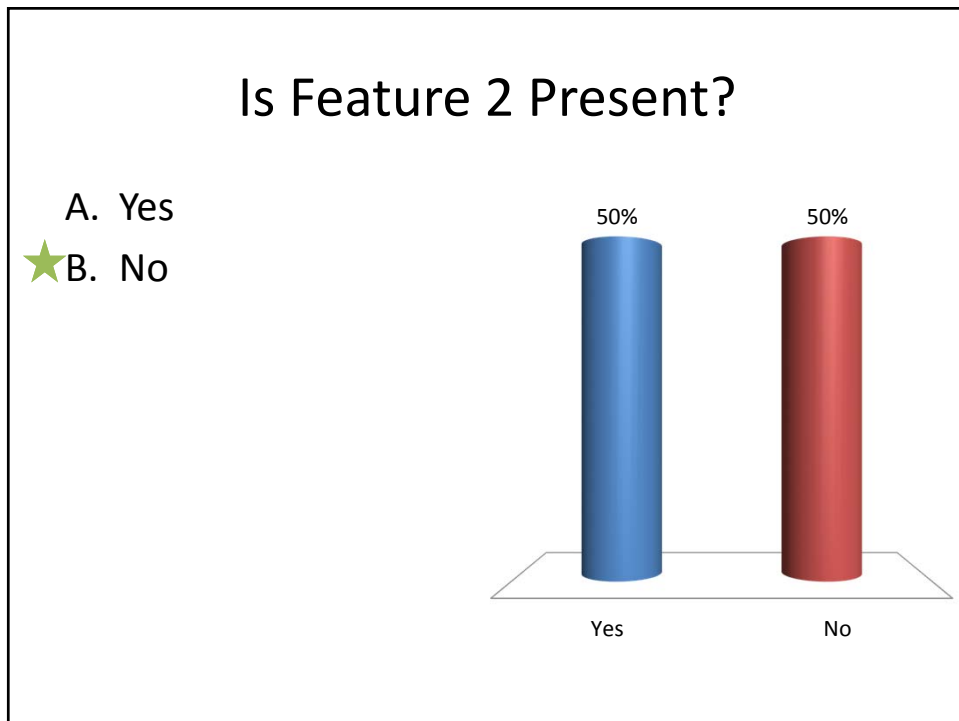
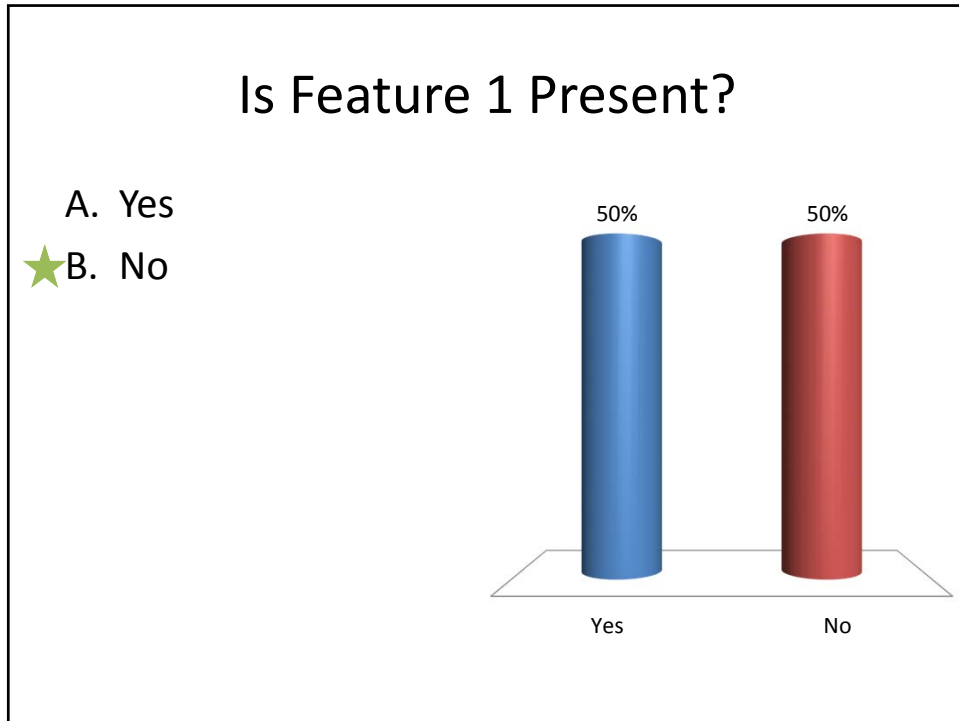


### 20. Speech/thinking fluctuate?

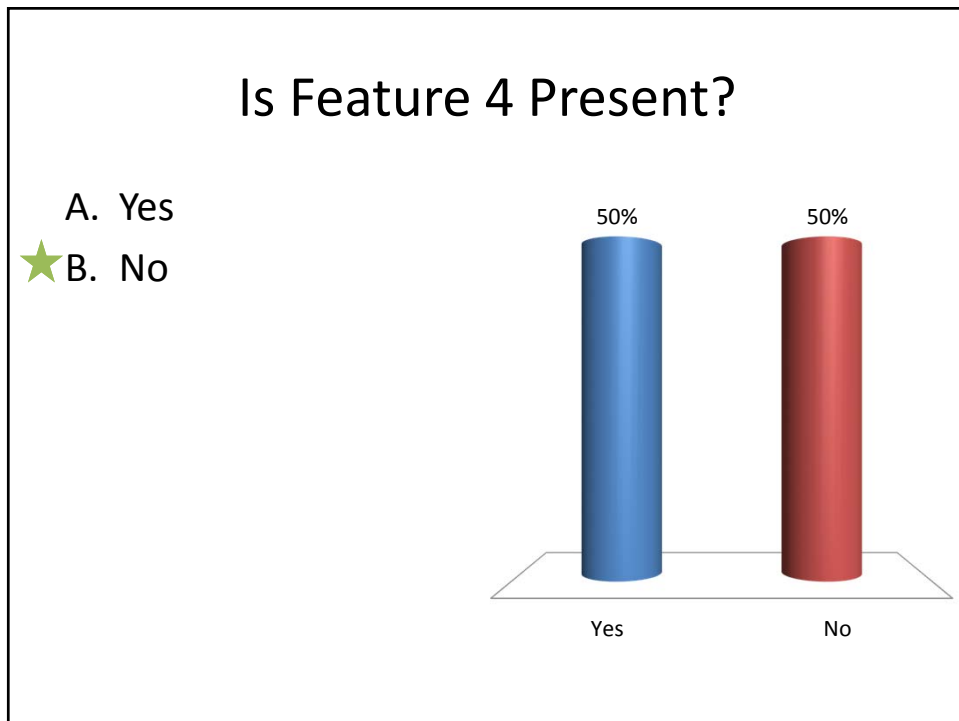
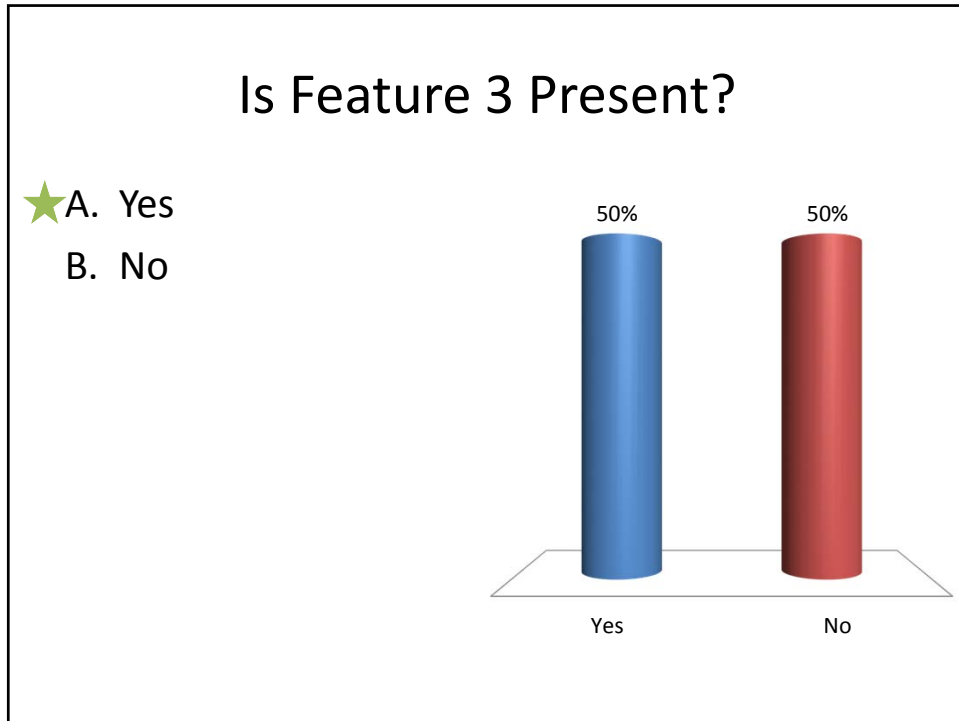
A. Yes

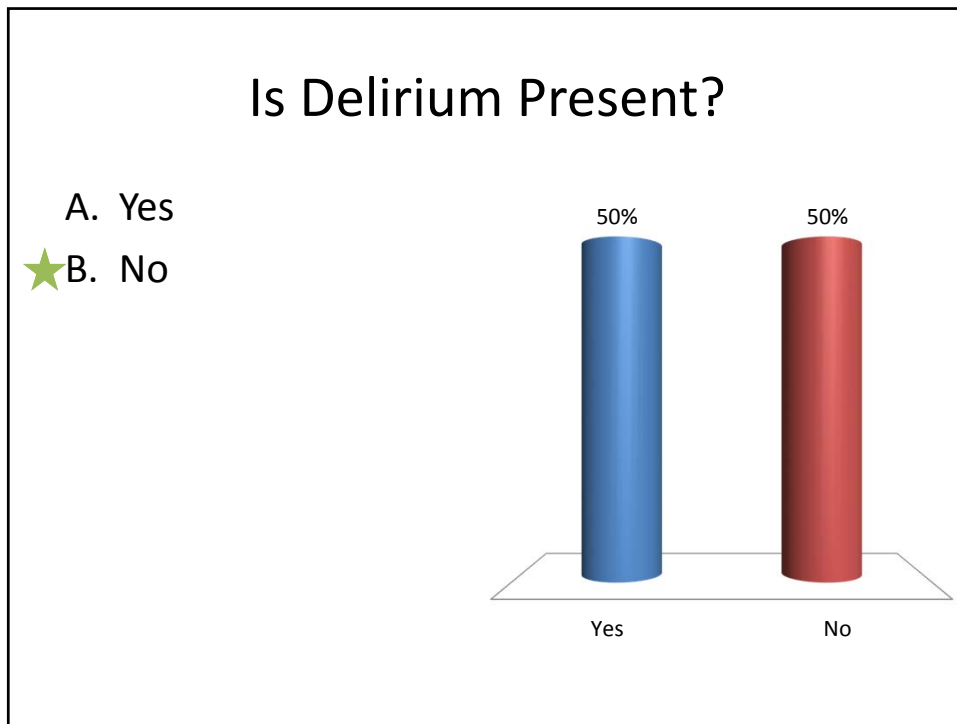
★ B. No





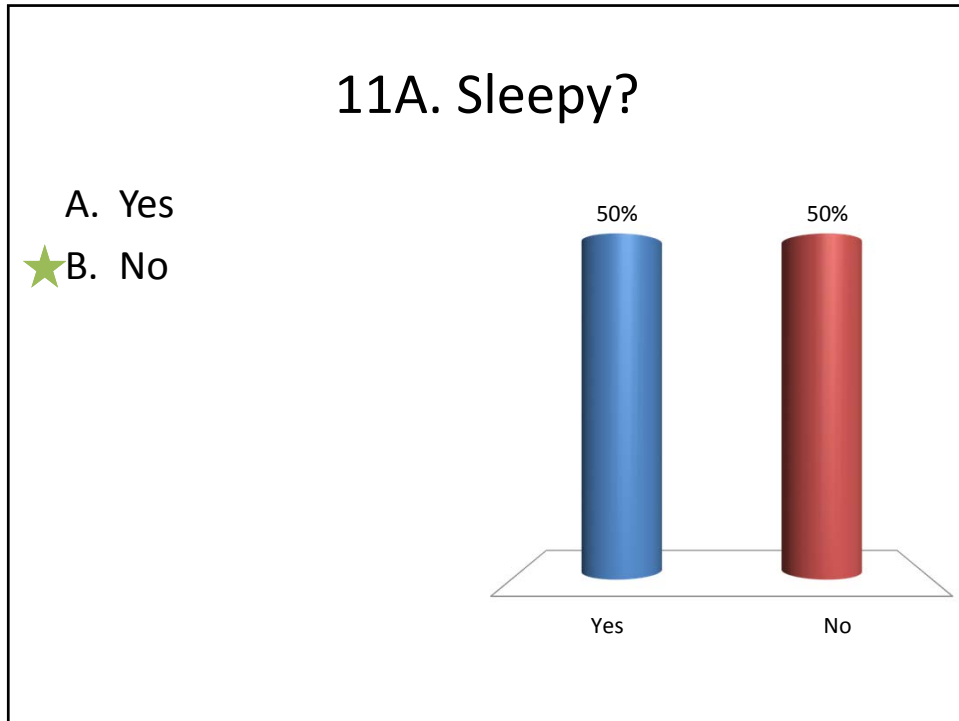






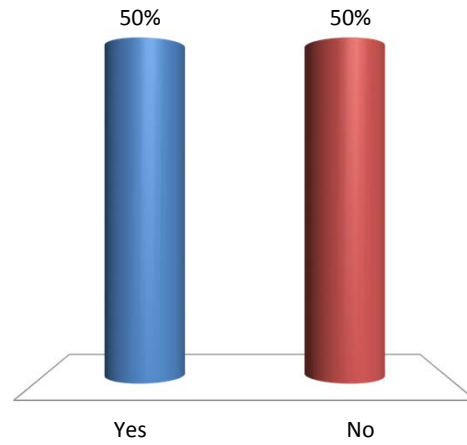
# DAY 2

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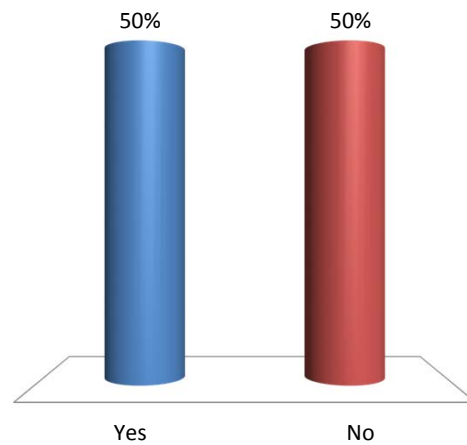
## 12. Hypervigilant?

- ★ A. Yes
- B. No



## 13. Flow of ideas unclear or illogical?

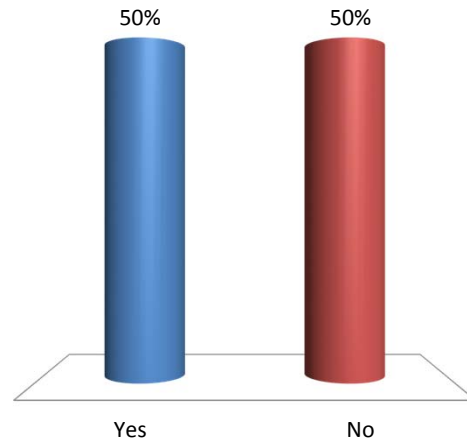
- ★ A. Yes
- B. No



### 14. Conversation rambling?

A. Yes

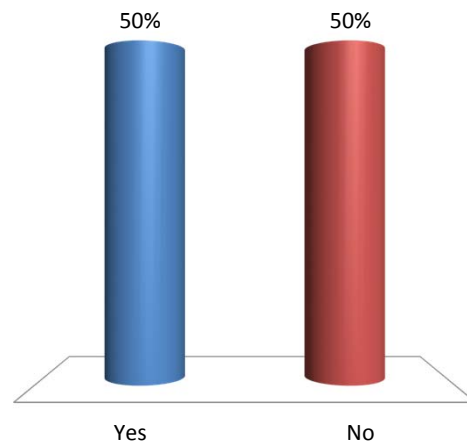
★ B. No



### 15. Speech limited or sparse?

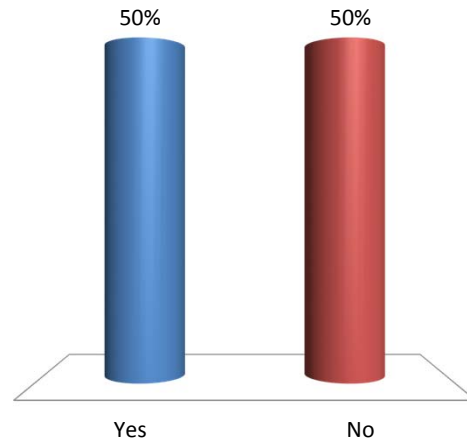
A. Yes

★ B. No



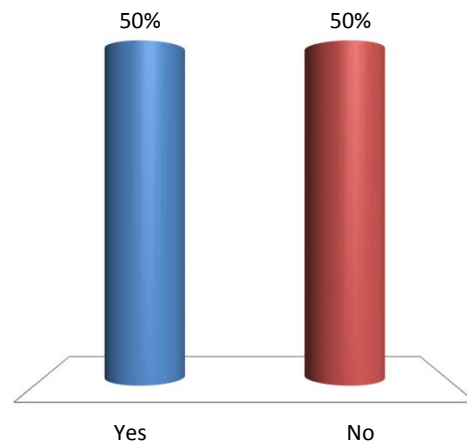
### 16. Trouble keeping track?

- A. Yes
- ★ B. No



### 17. Inappropriately distracted?

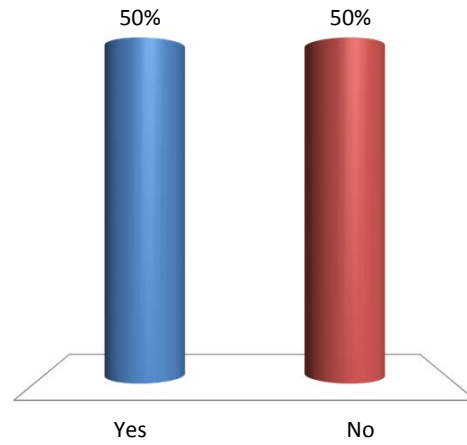
- ★ A. Yes
- B. No



### 18. Level of consciousness fluctuate?

A. Yes

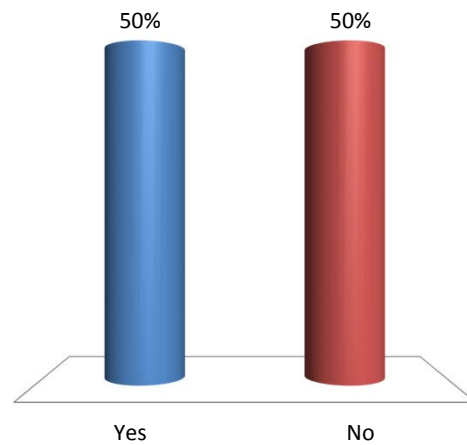
★ B. No

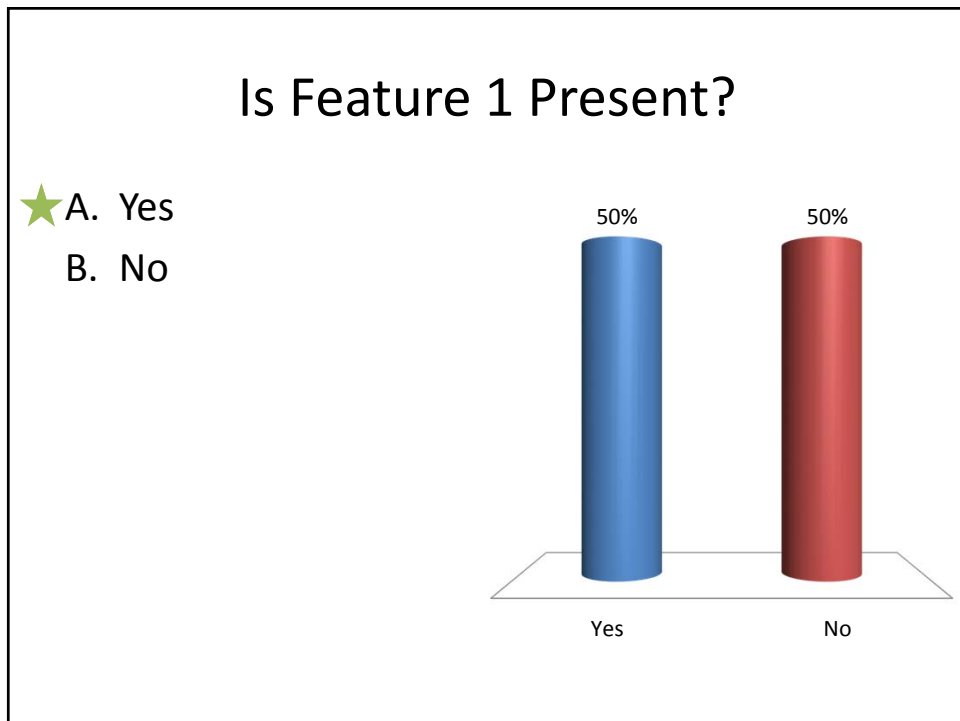
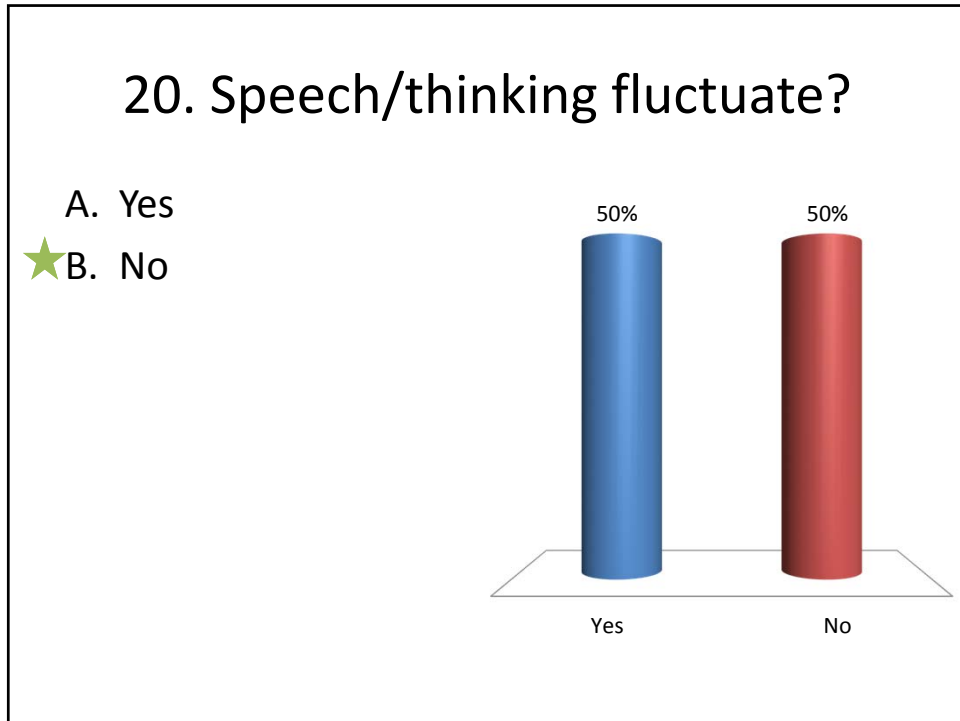


### 19. Level of attention fluctuate?

★ A. Yes

B. No

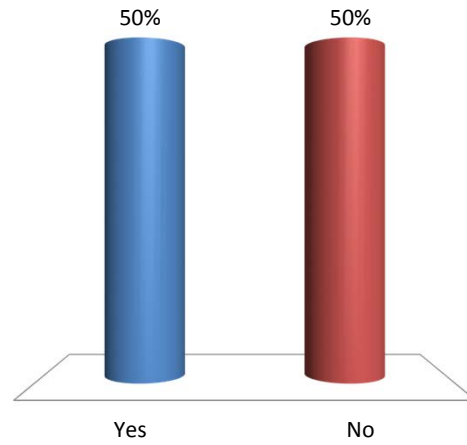






### Is Feature 2 Present?

- ★ A. Yes
- B. No



### Is Feature 3 Present?

- ★ A. Yes
- B. No

