

## MCQs 3 to 18

### Delirium Post-test Questions

1. Which of the following medications is most likely to be contributing to the above patient's delirium?
  - a. Famotidine
  - b. **Propranolol**
  - c. Glipizide
  - d. Hydrochlorothiazide
2. Which of the following would be the most appropriate first step in management of this patient?
  - a. CT of the head without contrast
  - b. CBC, metabolic panel
  - c. **Fingerstick glucose level**
  - d. Discontinue use of oxycodone
3. When an 86-year-old man is admitted to your rehabilitation facility on Tuesday morning with deconditioning following a prolonged hospitalization, he is awake, alert, and oriented to person, place, and time. While you are rounding on Wednesday morning you notice that he is slightly difficult to arouse and falls asleep several times during your exam. When you ask for the date he tells you his birthdate. When you ask again for the current year he tells you it is 1989, and he cannot tell you the name of the city. Later in the morning he is more awake and is again oriented to the correct time and place. Which of the following characteristics of the scenario above is a criterion from the Confusion Assessment Method (CAM)?
  - a. Acute onset
  - b. Fluctuating course
  - c. Advanced patient age
  - d. **a and b only**
4. You admit a patient to your inpatient rehabilitation facility and as part of your admission you administer the Folstein Mini-Mental State Examination. The patient does well with most tasks but has significant difficulty counting backwards from 100. He says he was never good with math. You then ask him to spell "world" backwards. Which parameter does this activity test?
  - a. Memory
  - b. **Attention**
  - c. Spatial ability
  - d. Reasoning

5. Of the features listed below, which is the most important in determining whether a patient has delirium?
  - a. Memory impairment
  - b. **Inattention**
  - c. Psychomotor agitation
  - d. Confusion
6. Which of the following is a feature of delirium that can help differentiate it from dementia?
  - a. Memory loss
  - b. Inattention
  - c. **Fluctuating course**
  - d. Disorganized thinking
7. Which of the following is NOT a predisposing factor for development of delirium?
  - a. Age greater than 65
  - b. **Female gender**
  - c. Prior history of delirium
  - d. Immobility
8. When pharmacologic therapy is necessary, which option below is preferred as first-line treatment?
  - a. Lorazepam 0.5 mg IV
  - b. **Haloperidol 0.5 mg PO**
  - c. Lorazepam 1 mg PO
  - d. Quetiapine 25 mg PO

## **Vignette**

Patient MM is a 73-year-old woman with a past medical history of HTN, DM, osteoarthritis, chronic low back pain, tremor, hearing loss, and hyperlipidemia who presented to the ED 10 days ago complaining of weakness and slurred speech that began upon awakening on the day of admission and involved left face, arm, and leg weakness and numbness. An MRI/ MRA of the head and neck showed a subacute right MCA infarct and patent intracranial vessels. The discharge summary states that a full stroke work-up on the acute inpatient neurology service was otherwise unremarkable but she suffered a fall 2 days prior to discharge. She sustained no injuries.

Upon admission to your acute rehabilitation facility, her exam is remarkable for left arm weakness 3/5, left leg weakness 4-/5, left facial droop, and dysarthria. During the interview, you notice she is drowsy and names the incorrect month and season. She scores an 18/30 on the Folstein MMSE, missing several answers because she had significant difficulty focusing on your questions. Vital signs are normal.

Her daughter is present at the bedside and concerned about her mother, saying that on several occasions in the last few days she “had not been herself” and had rambling speech, appeared to be confused, and asked her the same questions repeatedly. At other times, however, she was “back to normal.” The daughter also notes that in the last year her mother has had several episodes of “confusion” involving word-finding difficulty and slurred speech. Although the patient had been driving and completing basic errands prior to her admission, her daughter had to start managing the patient’s finances several months ago.

Medications include aspirin 81 mg PO daily, simvastatin 80 mg PO qhs, famotidine 20 mg PO daily, propranolol 40 mg PO q12h, glipizide 5 mg PO BID, hydrochlorothiazide 12.5 mg PO daily, oxycodone extended release 10 mg PO q12h, multivitamin 1 tablet PO daily, docusate 100 mg PO q12h, acetaminophen/oxycodone 5/325 mg PO q4h PRN pain, and Ambien 5 mg PO qhs PRN sleep.

## Tasks

1. Review the PowerPoint slideshow on the shared drive entitled “Delirium in the Elderly.”
2. Develop a differential diagnosis for the patient’s alteration in mental status.
3. Use the Confusion Assessment Method (CAM) to identify whether this patient has delirium.
4. Identify the factors that could be contributing to this patient’s altered mental status.
5. Develop a management plan to address the altered mental status.

## **Commentary – Delirium**

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Delirium is not a disease but rather a systemic syndrome, characterized by decreased attention span and a waxing and waning type of confusion or alteration of consciousness. It is caused by an array of chemical or disease-mediated processes disrupting normal cerebral function.

Clinically, delirium may present with hyperactive symptoms, such as agitation, combativeness, and hallucinations/delusions. Interestingly, these behaviors are reported more often by night-shift staff, as delirious patients tend to be more agitated and combative in evenings or at night time when environmental stimulation decreases and visual perceptions are disturbed. Such presentation should be differentiated from psychosis. Delirium may also present with hypoactive symptoms, such as inability to converse, focus attention, or follow commands, as in the presented patient MM, which should be differentiated from dementia or depression.

Delirium is probably the single most common acute state affecting adults in general hospitals. It affects 10%–20% of all hospitalized adults, 30%–40% of elderly hospitalized patients, and up to 80% of ICU patients. In my experience in the acute rehabilitation setting, delirium is extremely common following major cardiac surgery. The incidence of delirium could be up to 20% in patients 60 years and older. This could be due to a combination of factors, such as older age, anesthesia, electrolyte disturbances, sleep deprivation, and post-op pain medication. Stroke is another risk factor for delirium; delirium may be associated with specific stroke types, such as ICH and total anterior circulation infarction, or specific lesion locations such as the thalamus and caudate nucleus.

The main predisposing factors for development of delirium include older age, male gender, dementia, severe illness, visual impairment, psychiatric disorders, alcohol abuse, physical frailty, polypharmacy, malnutrition, renal impairment, and dehydration. In the acute hospital setting, we regularly induce or aggravate delirium with sleep deprivation, environmental change, medications, and overall dehumanizing of patients. The presence of delirium increases the risk of poor functional outcome. These patients have more trouble participating in therapies, less information retention, more functional fluctuations, and a lower chance of being discharged home. Recognizing delirium, differentiating its etiology, and initiating treatments early can affect rehabilitation outcome. More importantly, we need to realize that 1/3 of all cases of delirium may be prevented. Prevention can be achieved by reducing polypharmacy, maintaining fluid and electrolyte balance, improving environmental stimuli, and advancing staff education.

Treatment of delirium requires early recognition and differentiation of underlying causes in each patient, as various etiologies may contribute to delirium. Further testing and management plans need to address the most urgent and correctable etiologies, followed by those conditions that are non-urgent or chronic.

## **Answer Key — Questions**

1. — b

Propranolol can contribute to delirium and altered mental status in susceptible individuals. The other drugs listed are not usually associated with delirium to the same degree as propranolol. *Difficulty—hard*

2. — c

This patient has diabetes and is on a sulfonylurea, which can cause hypoglycemia, and it is important to rule out low blood glucose as a cause of her symptoms. The test can be done quickly at the bedside. Answers b and d are appropriate in management but are not necessarily the best first step. Answer a, CT of the head, would likely not be needed, since the patient suffers from delirium and your initial work-up and management will probably rectify her symptoms. *Difficulty—hard*

3. — d

Acute onset and fluctuating course are criteria for the diagnosis of delirium according to the CAM. While older people with multiple medical comorbidities are susceptible to delirium, advanced patient age is not a criterion as part of the CAM. *Difficulty—easy*

4. — b

Recalling 3 items tests memory, and copying figures tests spatial processing. Educational level is not tested directly in the MMSE, but a lower educational level can create a falsely low score. *Difficulty—moderate*

5. — b

Inattention is an important characteristic of delirium. Diagnosis requires the presence of inattention, acute onset, fluctuating course, and either disorganized thinking or altered level of consciousness. *Difficulty—easy*

6. — c

Fluctuating course is a diagnostic criterion for delirium. In the dementia syndromes, the course usually involves a steady or stepwise decline in functioning without return to baseline, as in delirium. Memory loss can be present in both delirium and dementia. Slow onset is characteristic of dementia, not delirium, which has an acute onset. *Difficulty—easy*

7. — b

Males are more predisposed to develop delirium.

8. —b

Haloperidol 0.5 mg PO or IM is first-line therapy and PO dosing can be repeated q4h. Alternatively, 0.5 mg IM can be repeated q1h. Lorazepam is an acceptable choice, although it can cause paradoxical agitation in some patients.

## **Answer Key — Vignette Tasks**

Develop a differential diagnosis for the patient's alteration in mental status.

- Delirium
- Dementia
- Alzheimer's disease
- Vascular dementia
- Depression
- Pseudodementia
- Stroke

Use the Confusion Assessment Method (CAM) to identify whether this patient has delirium.

The patient meets the CAM criteria:

- Acute onset — new since hospitalized
- Fluctuating symptoms — “back to normal”
- Altered mental status (drowsiness)
- Disorganized thinking (rambling speech)

Identify the factors that could be contributing to this patient's altered mental status (delirium).

- Polypharmacy — narcotics, Ambien, propranolol, famotidine
- DM — patient could be having changes in blood sugar; sulfonylurea could cause hypoglycemia
- Altered sensorium (hearing loss at baseline)
- Unfamiliar environment and hospital setting
- Fatigue, sleep deprivation, and altered circadian cycles
- Underlying cognitive deficit
- Patient is post-stroke

Develop a management plan to address the altered mental status.

- Limit narcotic use
- Closely monitor blood sugar; avoid large changes in glucose level and avoid hypoglycemia
- D/C Ambien
- Change propranolol to another beta-blocker
- Provide patient with all items necessary to avoid alterations in sensorium:
  - Glasses
  - Dentures
  - Hearing aids

Limit interruptions in sleep (reduce vital sign checks, early AM blood draws)

Provide exposure to natural light/other zeitgeibers when possible

Allow maximal time for family visits and contact