Management of Delirium

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Disclosures

• There are no conflicts of interest or financial disclosures.
A little humor to begin

“You’ve been awfully tense lately. They say petting a cat is a great way to relieve stress!”
Learning Objectives:

1. To understand the definition/background of delirium.
2. To understand factors influencing delirium.
3. To understand the causes of delirium.
4. To understand the criteria for diagnosis of delirium.
5. To understand how to perform a delirium evaluation and testing.
6. To help differentiate a psychiatric disorder from delirium.
7. To understand effective management (including medication, external factors, etc.) for delirium.
Pretest

• Delirium and dementia are mutually exclusive. **T/F**

• Low-dose haloperidol prophylaxis reduces the incidence of post-op delirium. **T/F**

• Light deprivation exacerbates delirium. **T/F**

• Delirium symptom severity characteristically fluctuates during a 24-hour period. **T/F**

• Agitation is the main characteristic of delirium. **T/F**
Pretest Answers

• Delirium and dementia are mutually exclusive. F

• Low-dose haloperidol prophylaxis reduces the incidence of post-op delirium. F

• Light deprivation exacerbates delirium. T

• Delirium symptom severity characteristically fluctuates during a 24-hour period. F

• Agitation is the main characteristic of delirium. T
Delirium: Background

• In patients who are admitted with delirium, mortality rates are 10-26%.

• An estimated 10%-64% inpatients have delirium during their hospitalization. (Up to 61% for special populations like elderly patients admitted for femoral neck fractures.)

• The incidence of delirium in critical care settings may range from 7%-80%.

• Mortality rates for patients who develop delirium during hospitalization have been reported to be between 22%-76%.

• Delirium tremens, the most serious manifestation of alcohol withdrawal occurs in approximately 5% of hospitalized patients with alcohol dependence.
Delirium: Definition

- A neuropsychiatric syndrome, which is characterized by an acute onset of fluctuating cognitive impairment and a disturbance of consciousness, in contrast to a previously attained baseline level of cognitive function.

This is evidenced by attention deficits, disorientation and memory or language disturbance, and generalized severe disorganization of behavior, with a fluctuating course.

It typically involves other cognitive deficits, changes in arousal (hyperactive, hypoactive, or mixed), emotional changes, perceptual deficits, altered sleep-wake cycle, and psychotic features such as hallucinations and delusions.

As delirium is a syndrome, it is important to note that many causes can result in a similar pattern of signs & symptoms.
Other Names for Delirium

- Intensive care unit psychosis
- Acute confusional state
- Acute brain failure
- Encephalitis
- Encephalopathy (metabolic)
- Toxic metabolic state
- Central nervous system toxicity
- Paraneoplastic limbic encephalitis
- Sundowning
- Cerebral insufficiency
- Organic brain syndrome
- Beclouded dementia
- Toxic psychosis
Factors Influencing Delirium

- Vision impairment
- Medical illnesses (severity/quantity)
- Cognitive impairment
- Older than 70 years
- Any iatrogenic event
- Use of physical restraints
- Malnutrition
- More than 3 medications added
- Hypertension
- COPD
- Alcohol abuse
- Smoking history
- Abnormal sodium level
Factors Influencing Delirium: Cont.

- Abnormal glucose level
- Abnormal bilirubin level
- Blood urea nitrogen to creatinine ratio >18
- Use of bladder catheter
- Preoperative cognitive impairment
- Functional limitations
- History of delirium
- Abnormal potassium, sodium, or glucose test
- Preoperative use of benzodiazepines or narcotic analgesics
- Epidural use
Delirium Causes (mnemonic)

Drugs: (including alcohol, analgesics, steroids, sedatives, anticonvulsants, antihistamines, antihypertensives, antidepressants, antibiotics, sympathomimetics, and recreational substances)

Ears, eyes, and other sensory deficits

Low pO2 states: (including MI, PE, anemia, CVA, pneumonia; Low B vitamins: B1, B3, B9, B12

Infections: (including encephalitis, meningitis, pneumonia, UTI, and etc.)

Retention of urine or feces

Intracranial: (including subdural hematoma, strokes, seizures, etc.)

Underhydration/ undernutrition

Metabolic: (including hypothyroidism “myxedema madness”, hypoglycemia, uremia, liver failure, hypo/hypernatremia, etc.)

& Pain!
# Table 1  Causes of Delirium: “I WATCH DEATH”

<table>
<thead>
<tr>
<th>Potential Causes</th>
<th>Differential Diagnosis</th>
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<tbody>
<tr>
<td>Infectious</td>
<td>Sepsis, encephalitis, meningitis, syphilis, central nervous system abscess</td>
</tr>
<tr>
<td>Withdrawal</td>
<td>Alcohol, barbiturates, sedative-hypnotics</td>
</tr>
<tr>
<td>Acute metabolic</td>
<td>Acidosis, electrolyte disturbance, hepatic/renal failure, other metabolic disturbances</td>
</tr>
<tr>
<td></td>
<td>(glucose, magnesium, calcium)</td>
</tr>
<tr>
<td>Trauma</td>
<td>Head, burns</td>
</tr>
<tr>
<td>Central nervous system</td>
<td>Hemorrhage, cerebrovascular accident, vasculitis, seizures, tumor</td>
</tr>
<tr>
<td>Hypoxia</td>
<td>Acute hypoxia, chronic lung disease, hypotension</td>
</tr>
<tr>
<td>Deficiencies</td>
<td>Vitamin B12, hypovitaminosis, niacin, thiamine</td>
</tr>
<tr>
<td>Environmental</td>
<td>Hypo/hyperthermia, endocrinopathies, diabetes, adrenal, thyroid</td>
</tr>
<tr>
<td>Acute vascular</td>
<td>Hypertensive emergency, subarachnoid hemorrhage, sagittal vein thrombosis</td>
</tr>
<tr>
<td>Toxins/drugs</td>
<td>Medications, street drugs, alcohols, pesticides, industrial poisons, carbon monoxide,</td>
</tr>
<tr>
<td></td>
<td>cyanide, solvents, etc.</td>
</tr>
<tr>
<td>Heavy metals</td>
<td>Lead, mercury</td>
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</tbody>
</table>

Delirium causing Drugs (mnemonic)

• The physician dealing with delirium gets no naps. “NO NAPS HERE":

  NSAIDs
  Opiates
  Nausea (antiemetics)
  Anticholinergics
  Parkinsonian drugs
  Sedative, hypnotics
  H2 blockers
  EtOH
  Rhythm (antiarrhythmics & Beta-blockers)
  Epilepsy (anticonvulsants)
Medications Causing Delirium

- Pain medications
- Antibiotics, antivirals, and antifungals
- Steroids
- Anesthesia
- Cardiac medications
- Antihypertensives
- Antineoplastic agents
- Anticholinergic agents
- Medications leading to Neuroleptic Malignant Syndrome and Serotonin Syndrome
Why is delirium underdiagnosed?

• Changes in diagnostic criteria.

• Health practitioners are unaccustomed to testing for attention.

• Practicing physicians fail to appreciate the significance of delirium as a harbinger and independent predictor of mortality.

• Physicians are uncertain how to treat and manage delirium independent of its underlying pathology.
DSM IV-TR Criteria

• **Delirium due to [general medical condition]:**

  A. Disturbance of consciousness (i.e., reduced clarity of awareness of the environment) with reduced ability to focus, sustain, or shift attention.

  B. A change in cognition (such as memory deficit, disorientation, language disturbance) or the development of a perceptual disturbance that is not better accounted for by a preexisting, established, or evolving dementia.

  C. The disturbance develops over a short period of time (usually hours to days) and tends to fluctuate during the course of the day.

  D. There is evidence from the history, physical examination or laboratory findings that the disturbance is caused by the direct physiological consequences of a general medical condition.
DSM 5 Criteria

• Delirium due to another medical condition:
  A. Disturbance in attention (i.e., reduced ability to direct, focus, sustain, and shift attention) and awareness (reduced orientation to the environment).

  B. The disturbance develops over a short period of time (usually hours to a few days) and tends to fluctuate in severity during the course of a day.

  C. An additional disturbance in cognition (e.g., memory deficit, disorientation, language, visuospatial ability, or perception).

  D. There is evidence from the history, physical examination or laboratory findings that the disturbance is caused by the direct physiological consequences of a general medical condition.
3 Types of Delirium

• 1. Hyperactive or hyperalert:
Hyperactive, combative and uncooperative. May appear to be responding to internal stimuli, Frequently these patients come to our attention because of the care difficulty.

• 2. Hypoactive or hypoalert:
Passive demeanor, slow speech, somnolence, and, in extreme cases, stupor and coma. Misses meals, medications, appointments. They do not ask for care or attention. This type is easy to miss because caring for these patients is not problematic to staff.

• 3. Mixed:
A combination of both types just described. Over the course of the illness, many patients manifest a combination of behaviors (mixed delirium).
Delirium: Evaluation and Testing

• Look at chart notes with particular attention to level of consciousness, behavior and level of cooperativeness

• Look at the overall time course

• Review med list including scheduled, PRNs, doses, recent meds discontinued or started

• Evaluate for recent medical illness and interventions

• Screen for history of substance dependence to determine risk of withdrawal
Delirium: Evaluation and Testing

- Review diagnostic studies including labs, imaging, vital signs

- Gather collateral information from family/friends regarding baseline function, personality, psych history

- Interview patient paying close attention to concentration, level of somnolence, mood lability, executive function, short term memory deficits, kinetics. Use MMSE.

- Awareness & perceptual disturbances can be tested by simple observation, or direct questioning of the patient and/or nursing staff.

- Memory & orientation can be tested by direct questions.
Delirium: Evaluation and Testing

• Mini mental status exam (MMSE) is not sensitive in identifying delirium, however repeated MMSEs can reveal waxing and waning course.

• Most sensitive items are serial 7’s, orientation, and recall memory.

• Tests of attention include serial 7’s, spelling WORLD backwards, months of the year backward, counting down from 20, or testing digit span (patients are asked to repeat 3, 4, and 5 digits forwards and backwards).

• Perhaps the best approach to testing attention in a clinical setting: Rate accessibility based on the patient's participation in the medical interview.

• Attention/accessibility can be scored from 0 to 10 after a conversation of at least 2 minutes duration. Zero means no conversation is possible because of stupor, coma, or extreme agitation. Ten means the patient was fully engaged throughout the interview.

• One could also rank attention as mild, moderate, or severe, depending on the patient's ability to engage in the medical interview.
<table>
<thead>
<tr>
<th>Feature*</th>
<th>Assessment</th>
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</table>
| #1 Acute onset and fluctuating course | Usually obtained from a family member or nurse and shown by positive responses to the following questions:  
  • “Is there evidence of an acute change in mental status from the patient’s baseline?”  
  • “Did the abnormal behavior fluctuate during the day, that is, tend to come and go, or increase and decrease in severity?” |
| #2 Inattention | Shown by a positive response to the following:  
  • “Did the patient have difficulty focusing attention, for example, being easily distractible or having difficulty keeping track of what was being said?” |
| #3 Disorganized thinking | Shown by a positive response to the following:  
  • “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?” |
| #4 Altered level of consciousness | Shown by any answer other than “alert” to the following:  
  • “Overall, how would you rate this patient’s level of consciousness?”  
    - Normal = alert  
    - Hyperalert = vigilant  
    - Drowsy, easily aroused = lethargic  
    - Difficult to arouse = stupor  
    - Unarousable = coma |

* The diagnosis of delirium requires the presence of features #1 AND #2 plus either #3 OR #4.  
Delirium Workup

- Comprehensive metabolic profile
- CBC with differential
- Thyroid function tests
- RPR
- HIV antibody test
- Urinalysis
- Electrocardiogram
- Electroencephalogram
- Chest radiograph
- Blood and urine drug screens
- Blood, urine, and CSF cultures
- B12
- Folic acid
- CT of the brain
- MRI of the brain
- Lumbar puncture and CSF examination

Please note: Standard tests and/or additional studies should be performed based on the clinical presentation.
Psychiatric Differential Diagnosis for Delirium (based on DSM 5)

ADHD
Acute stress disorder
Brief psychotic disorder
Major or mild neurocognitive disorders (dementia)
Autism spectrum disorder
Bipolar I/II disorder
Substance intoxication/withdrawal
Conversion disorder
Factitious disorder
Major depressive disorder
Malingering
Schizophreniform disorder
Schizophrenia spectrum and other psychotic disorders
Intellectual developmental disorder
Dissociative disorders

(this is not an all inclusive differential diagnosis)
Delirium vs. Schizophrenia

- Onset of schizophrenia is rarely after 50.

- Auditory hallucinations are much more common than visual hallucinations.

- Delusions and hallucinations are more organized and more constant.

- Memory is grossly intact and disorientation is rare.

- Speech is not dysarthric.

- No wide fluctuations over the course of a day.
Delirium vs Mood disorders

- Mood disorders manifest persistent rather than labile mood with more gradual onset.

- In mania, the patient can be very agitated however cognitive performance is not usually as impaired.

- Flight of ideas usually have some thread of coherence unlike simple distractibility.

- Disorientation is unusual in mania.
Delirium vs Other Psychiatric Disorder

- Clouded consciousness or decreased level of alertness.
- Disorientation.
- Acuity of onset and course- serial mental status exams can help demonstrate this.
- Age >40 without prior psych history.
- Presence of risk factors for delirium, recent medical illness or treatment.
Delirium and EEG

• The EEG is not pathognomonic of delirium, as it cannot distinguish it from dementia.

• Diffuse slowing is seen with either condition (dementia and delirium).

• However, a normal EEG would suggest that the patient's symptoms may be due to a functional psychiatric illness, in the absence of any apparent organic basis for delirium.
<table>
<thead>
<tr>
<th></th>
<th>Delirium</th>
<th>Dementia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Onset</td>
<td>Abrupt</td>
<td>Usually insidious; abrupt in some strokes or trauma</td>
</tr>
<tr>
<td>Course</td>
<td>Fluctuates</td>
<td>Slow decline</td>
</tr>
<tr>
<td>Duration</td>
<td>Hours to weeks</td>
<td>Months to years</td>
</tr>
<tr>
<td>Attention</td>
<td>Impaired</td>
<td>Intact early; often impaired late</td>
</tr>
<tr>
<td>Sleep-wake</td>
<td>Disrupted</td>
<td>Usually normal</td>
</tr>
<tr>
<td>Alertness</td>
<td>Impaired</td>
<td>Normal</td>
</tr>
<tr>
<td>Orientation</td>
<td>Impaired</td>
<td>Intact early; impaired late</td>
</tr>
<tr>
<td>Behavior</td>
<td>Agitated, withdrawn or depressed; or combination</td>
<td>Intact early</td>
</tr>
<tr>
<td>Speech</td>
<td>Incoherent, rapid/slowed</td>
<td>Word-finding problems</td>
</tr>
<tr>
<td>Thoughts</td>
<td>Disorganized, delusions</td>
<td>Impoverished</td>
</tr>
<tr>
<td>Perceptions</td>
<td>Hallucinations/illusions</td>
<td>Usually intact early</td>
</tr>
</tbody>
</table>

Delirium Management

- Antipsychotic drugs are efficacious, when compared with baseline, and safe for the treatment of delirium. Haloperidol is the most studied & used agent. (IV administration is associated with fewer extrapyramidal effects and is less painful.) Quetiapine is also commonly used.

Prophylactic low-dose haloperidol has no efficacy in reducing the incidence of post-operative delirium.

Use of narcotics may exacerbate the delirious state in a dose-dependent relationship.

Use of benzodiazepines as an outcome has limited clinical value. These drugs are anxiolytics and sedatives, and their use may be associated with a decrease in psychomotor agitation rather than a true beneficial effect on delirium. Additionally, their use is associated with an increased risk of delirium, which further limits the validity of this outcome measure.

An exception for benzodiazepine usage: Delirium tremens
Delirium Management

The T-A-DA method (Tolerate, Anticipate, Don't Agitate).

AVOID THE USE OF PHYSICAL RESTRAINTS! They are associated with poor outcomes: functional decline, decreased peripheral circulation, cardiovascular stress, incontinence, muscle atrophy, pressure ulcers, infections, further agitation, psychiatric morbidity, serious injuries, and death.

Communicate clearly and concisely; give repeated verbal reminders of the day, time, location, and identity of key individuals, such as members of the treatment team and relatives.

Provide clear signposts to patient's location including a clock, calendar, chart with the day's schedule.

Have familiar objects from the patient's home in the room (if possible).
Delirium Management

Ensure consistency in staff (for example, a key nurse).

Use television or radio for relaxation and to help the patient maintain contact with the outside world.

Involve family and caregivers to encourage feelings of security and orientation.

Simplify care area by removing unnecessary objects.

Please allow adequate space between each bed (if more than one bed is present in a hospital room).

Frequent reorientation by nursing staff.

Avoid restraints as this can worsen delirium and agitation.
Delirium Management

Avoid using medical jargon in patient's presence because it may encourage paranoia.

Consider using single rooms to aid rest and avoid extremes of sensory experience.

Ensure that lighting is adequate; provide a 40-60 W night light to reduce misperceptions.

Control sources of excess noise (such as staff, equipment, visitors); aim for <45 decibels in the day and <20 decibels at night.

Keep room temperature between 21.1°C to 23.8°C.
Delirium Management

Identify and correct sensory impairments; ensure patients have their glasses, hearing aid, dentures.

Consider whether an interpreter is needed.

Encourage self care and participation in treatment (for example, have patient give feedback on pain).

Arrange treatments to allow maximum periods of uninterrupted sleep.

Maintain activity levels: ambulatory patients should walk three times each day; non-ambulatory patients should undergo a full range of movements for 15 minutes three times each day.
<table>
<thead>
<tr>
<th>Medication</th>
<th>Dose Range</th>
<th>Routes of Administration</th>
<th>Side Effects</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Typical Antipsychotics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chlorpromazine</td>
<td>12.5–50 mg every 4–6 hours</td>
<td>PO, IV, IM, SC</td>
<td>Monitor for hypotension and anticholinergic side effects</td>
<td>May be preferred in agitated patients due to its sedative effect</td>
</tr>
<tr>
<td>Haloperidol</td>
<td>0.5–2 mg every 2–12 hours</td>
<td>PO, IV, IM, SC</td>
<td>Extrapyramidal side effects are more likely at doses &gt;4.5 mg/day. Monitor QT interval on EKG</td>
<td>Remains the gold-standard therapy for delirium</td>
</tr>
<tr>
<td>Atypical Antipsychotics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aripiprazole</td>
<td>5–30 mg every 24 hours</td>
<td>PO*, IM</td>
<td>Monitor for akathisia</td>
<td>Evidence is limited to case reports and case series</td>
</tr>
<tr>
<td>Olanzapine</td>
<td>2.5–5 mg every 12–24 hours</td>
<td>PO*, IM</td>
<td>Sedation is the main dose-limiting adverse effect</td>
<td>Older age, pre-existing dementia, and hypoactive delirium have been associated with poor response</td>
</tr>
<tr>
<td>Quetiapine</td>
<td>12.5–100 mg every 12–24 hours</td>
<td>PO</td>
<td>Sedation, orthostatic hypotension</td>
<td>Sedating effects may be helpful in patients with insomnia</td>
</tr>
<tr>
<td>Risperidone</td>
<td>0.25–1 mg every 12–24 hours</td>
<td>PO*</td>
<td>Extrapyramidal adverse effects are more likely seen at doses &gt;6 mg/day. Orthostatic hypotension</td>
<td>May be more effective in hypoactive delirium given lower risk of sedation</td>
</tr>
<tr>
<td>Ziprasidone</td>
<td>10–40 mg every 12–24 hours</td>
<td>PO, IM</td>
<td>Monitor QT interval on EKG</td>
<td>Evidence is limited to case reports</td>
</tr>
</tbody>
</table>

* Risperidone, olanzapine, and aripiprazole are available in the form of orally disintegrating tablets.
PO=by mouth; IV=intravenous; IM=intramuscular; SC=without food; PR=per rectum; EKG=electrocardiogram.

National Institute for Health and Care Excellence (NICE) diagram
Managing Delirium Tremens

• The initial therapeutic goal in these patients is control of agitation.

• Sedative-hypnotic drugs are recommended as the primary agents.

• Benzodiazepines are most commonly used and recommended by addiction specialists because of a favorable therapeutic/toxic effect index.

• Offer oral lorazepam as first-line treatment. However, choice among benzodiazepines may be guided by the following considerations: (1) agents with rapid onset control agitation more quickly, for example, oral or IV diazepam has a more rapid onset; (2) agents with long duration of action (ie., diazepam) provide a smooth treatment course with less breakthrough symptoms; (3) agents with shorter duration of activity (ie., lorazepam) may have lower risk when there is concern about prolonged sedation (patients who are elderly or who have substantial liver disease or other serious concomitant medical illness); and (4) cost.
Managing Delirium Tremens

• It is recommended that the dose be determined specifically for each individual patient and that medications be given in doses sufficient to achieve and maintain light somnolence as the recommended therapeutic end point.

• If symptoms persist or oral medication is declined, give parenteral medication.

• If a patient demonstrates agitation that is not controlled with extremely large doses of benzodiazepines, use of pentobarbital or propofol can be considered.

• If delirium tremens develops in a person during treatment for acute alcohol withdrawal, review their withdrawal drug regimen.

• Parenteral administration of thiamine (100 mg daily for at least 3 days, intravenous or intramuscular) is recommended to prevent or treat Wernicke-Korsakoff syndrome.
Delirium Course and Prognosis

The symptomology of delirium waxes and wanes, and continues to progress/fluctuate until the underlying cause is treated.

Most of the symptoms of delirium will resolve within a week of treating the underlying etiology.

It can take weeks for symptoms to resolve in some patients.

Some patients, particularly the elderly, may never return to baseline.
Delirium Education

• It can be quite upsetting for the patients’ caregivers and they might fear that the patient has a psychiatric illness.

• Caregivers of delirious patients have 12 times the risk for being diagnosed with a generalized anxiety disorder.

• Supporting caregivers through education (both verbal & written) about delirium has been shown to help reduce these negative impacts.
Brief Case Presentations
Case I

- Mr. A is a 72 year old white male with a history of hypertension, asthma, and benign prostatic hypertrophy, admitted 3 days ago for a unilateral lower extremity cellulitis. He was cooperative and oriented at time of admission, but has become agitated, uncooperative, occasionally confused, and somnolent over the past 24 hours. He appears to be communicating out loud to someone in his room, which is empty.

  His current medications include ramipril, ranitidine, naproxen, albuterol/ipratropium inhaler, levofloxacin, and O2 PRN via nasal cannula.

  He has no known psychiatric history, and consumes 2 beers every night. When you speak to him, he is extremely somnolent (fell asleep several times during the interview). He struggles to focus on questions and is unable to perform the Mini Mental State Exam. He believes that you are his best friend and that he is in Seattle, Washington (however, we are located in a city in Alabama).
Why delirium?

- Altered mental status developing over a short period of time
- Alternating agitation, confusion and somnolence
- Auditory hallucinations in a 72 y/o with no previous psych history
- Medications: ranitidine, inhalers, naproxen, levofloxacin.
- Hypoxia: He is on nasal O2 which indicates hypoxia
- Cellulitis
- Other possibilities: Stroke with his history of hypertension; Urinary tract infection with his history of benign prostatic hypertrophy; Metabolic abnormalities: electrolyte or glucose disturbances, liver or renal dysfunction, thyroid dysfunction; Alcohol withdrawal
Case II

• Mr. Z is an 84 year old black male with a history of hypertension, diabetes mellitus, peripheral neuropathy, and occasional (stable) angina. He was admitted 3 days ago for “failure to thrive.”

Two weeks prior to admission, he missed his weekly poker game—something he has not done in 13 years. The day before admission, his brother found him asleep in his living room. He was difficult to arouse minimally communicative, had been incontinent of urine, and hadn’t eaten in several days. His brother denied any history of mental illness or substance abuse, and noted that he is usually social and friendly.

Mr. Z was calm and cooperative at time of admission, but withdrawn. He was hyponatremic and during the course of his admission was treated for a UTI. However, he still remains somnolent and withdrawn. Medicine is requesting a consultation for evaluation of depression.

His current medications include insulin, atenolol, lisinopril, temazepam, azithromycycin, and aspirin.

When you speak to him, he is quiet, answers questions with monosyllables, has poor eye contact, and scores a 9/30 on MMSE with very poor effort.
A classic case of hypoactive delirium, however...

- Urinary incontinence with altered mental status should prompt concerns about normal pressure hydrocephalus.
- He could have had a stroke or fall given his hypertension, diabetes mellitus, and peripheral neuropathy - he needs a head CT.
- The urinary tract infection and hyponatremia could cause delirium and even with appropriate treatment his mental status may take weeks and even months (in the elderly) to return to baseline (some may never return to baseline).
- Medications
- Glycemic abnormalities
- Alcohol withdrawal or overdose
- The low MMSE reveals severe impairment which is common in delirium. His poor effort could signal inattention or depression. Does the patient have depression? Does the patient have an underlying neurocognitive disorder (dementia)?
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References

A little final humor.

“Opportunity texted me, tweeted me, linked to me, friended me, blogged me and spammed me. I was expecting it to knock!”
Acknowledgement

• I would like to extend my gratitude to Dr. Fiona Fonseca, MB BCh BAO. Thank you for your hard work/help in developing this presentation!
That's all folks!
Questions?