Pure Madness: Approach to Delirium Twitter/Instagram: **@emboardbombs**

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Objectives: discuss the key differences between delirium and dementia, list in detail the causes of delirium, diagnoses, and immediate treatment avenues, describe the general workup and presentation of delirious patients.

Dementia: consciousness retained, *chronic* and often progressive process
Presentation: progressive memory loss, apraxia, aphasia, agnosia, poor judgment
Delirium: consciousness impaired, *rapid* or acute change in mentation
Presentation: delusions, +/- hallucinations, illusions

Instead of memorizing that long list above, think about it this way: the key feature that really separates delirium from dementia are 2 factors- 1) abrupt onset, 2) altered mentation/consciousness.

There are an infinite number of reasons people can develop altered mental status. There is no mnemonic out there that will provide every possible disease. HOWEVER, you have to start somewhere, and this great mnemonic I personally use every day.

> "I have become death, destroyer of worlds".
> -John Oppenheimer (upon discovering the power of the Atomic bomb)

Organic causes of Delirium: "I AM DEATH"

Infection: the most common cause of delirium across all age groups. Respiratory > Urinary > GI > Soft tissue > CNS source.
Investigate likely sources: Soft tissue (thorough skin exam for rashes, joint swelling, lacerations, foot ulcers), Respiratory (auscultate, Chest x-ray), Blood (IV cultures, listen for murmurs, +/- echo), Urine, CNS (LP, consider CT head first if risk factors present).
Evaluate for SIRS criteria! We will not enter the debate on SIRS, its here to stay for a while, remember it for boards and quality metrics in practice. If present and strong clinical suspicion, early administration of antibiotics, IV fluid rehydration, follow up lactates.

Alcohol: the most common chemical cause of altered mental status in the US. Different flavors (no pun intended).
-Acute intoxication: includes ataxia, confusion, tender hepatomegaly, nausea/vomiting
-Acute withdrawal: <72 hours often involve tremors, sweating, palpitations, headache. Less commonly seizures.
-Delirium Tremens: ~48-96 hours. Rapid onset, altered sensorium, hallucinations, +/- seizures. Classically extreme sympathomimetic symptoms.
-Complications of alcoholism *(see handout on the website "Blame it on the Alcohol Withdrawal")*
Wernicke-Korsakoff syndrome
Wernicke is more acute and reversible with thiamine therapy. Triad of ophthalmoplegia, ataxia, confusion.
Korsakoff is considered more chronic and consists of irreversible memory issues (confabulation, anterograde and retrograde memory impairment.

Metabolic: *hypo/hyperglycemia*, hypo/hyperthyroidism, adrenal failure, acid/base changes
-Low glucose is one of the most common reasons people initially present obtunded to the ED. Stat finger stick glucose as soon as they come in the door is needed.
-High glucose plus n/v, abdominal pain and acidosis, should be concerning for DKA or HHS (hyperosmolar hyperglycemic state). *See handout on "One Kit Kat too many- DKA and HHNS" for more details.*
-Thyroid hormone alterations (high and low) can definitely cause altered mental status. Look for associated signs and symptoms that clearly differentiate between the two.
-Adrenal failure: triad of hypoglycemia, hyperkalemia, acidosis! These people look SICK. They likely have weight loss, nausea/vomiting, and on boards "tanning of skin" (rare!) secondary to ACTH release with that melanin precursor.
-Look for history of patients on chronic steroids who suddenly stop, tuberculosis, meningococcemia, Addison's.
-pH changes: heavy shifts in pH are concerning. Most commonly it is metabolic and respiratory acidosis.

Drugs: stimulants, depressants, or hallucinogens- you take your pick. It can also be prescription ones.
Common Illicit substances: cocaine, amphetamines, ecstasy, MDMA, LSD, PCP, bath salts
Common prescription medications: SSRI/SNRI/MOAIs, TCAs, BNZ'z, Lithium
Listen to our podcasts on "Excited Delirium- When in Vegas…" and "Saturday Night Fever- NMS and SS" for more details.

> -Always think Serotonin Syndrome if the following: febrile, prolonged DTRs with clonus, lower extremity

Electrolytes: hypo/hypernatremia, hypo/hypercalcemia
-Hyponatremia: confusion → seizures → coma → death. If symptomatic and <120, consider hypertonic saline- high risk of central pontine myelinolysis!

-Hypernatremia: same symptoms as hypo-Na.
-Hypocalcemia: first assess if hypocalcemia is actually false (correct for low albumin). Order EKG to evaluate for long QT.
-Hypercalcemia: these are the "stones, moans, bones, groans" people. Bone pain due to likely lysis/fracture, possible kidney stone, constipation, psychosis. Immediately begin with IV fluids to dilute the calcium, consider calcitonin > bisphosphonates as the former works faster. *See our handout on "When the bad gets worse: oncologic emergencies" for more details on hypercalcemia management.*

Acute stroke: usually hemorrhage > ischemic. Ischemic strokes are less likely to cause major shifts in sensorium.

Trauma: typically concussions or hemorrhage such as epidural, subdural, subarachnoid.

Heavy metals/toxins: lead, mercury, arsenic, cyanide, CO.

Last but not least: **Psychogenic**
There is a reason this category is not detailed in the above mnemonic. Inorganic, or psychogenic, causes of delirium should always be a *diagnosis of exclusion*, meaning that all of the above organic causes should be ruled out before pursuing a psychological cause of illness. Many of the above causes have specific treatments or management plans, and many are time-sensitive in order to achieve the best clinical outcome for patients!

Common psychogenic offenders of delirium:

- **Acute Psychosis** (or acute delirium or acute psychotic disorder): <1 month of delirious behavior such as delusions, hallucinations (auditory > visual), or illusions.
- **Schizophreniform disorder**: 1-6 months of worsening psychotic symptoms. See Schizophrenia below for more details.
- **Schizophrenia**: >6 months of psychotic behavior, manifesting as 2 different categories of symptoms-
    - **Positive symptoms:** think of these as "adding" something new to the patient's behavior (delusions, paranoia, hallucinations, illusions).
    - **Negative symptoms:** think of these as "subtracting" something from the patient (social isolation, flat affect, failing in school, self-harm/suicidal thoughts)
- **Bipolar Disorder with psychotic features**
- **Schizoaffective disorder**: major depressive disorder + psychosis

Initial triage diagnostic steps to delirium

1) Is it acute delirium vs dementia?
    a. Assess ABC's: Is the patient responsive? Is he/she protecting their airway? Breath sounds bilaterally? What is the HR and BP?
    b. Ask family/friends/EMS- basically whoever came with the patient. Is this person at their mental baseline of functioning? How rapid was the decline?
    c. Associated symptoms? Too many to list but start forming your pertinent positive/negatives. Top ones that you should *always* ask: recent trauma/falls, history of brain masses/seizures/stroke, taking any blood thinners, daily functioning tasks at home, previous neurological deficits, illicit drug/alcohol use.
    d. Any history of dementia? This could be an exacerbation or delirium on top of dementia.
    e. Physical exam: neurologically directed, if able to participate.

2) Measure glucose level. Hypoglycemia is incredibly common, although it's also incredibly easy finding to miss. If <90, address with IV dextrose solution and/or snacks if the patient can eat.
3) EKG to assess cardiac rhythm. Patient could have new onset arrhythmia.
4) Blood work with imaging (electrolytes, CBC with diff, TSH, urine, +/- chest x-ray, CT head). You are now addressing the following concerns 1) sepsis, 2) metabolic or endocrine causes, 3) stroke/brain mass/bleeding.