

Catatonia: DDx Diagnosis and MSE

Idris Leppla, MD
Assistant Professor of Psychiatry
Johns Hopkins School of Medicine
Bayview Medical Center



JOHNS HOPKINS
M E D I C I N E

Lecture Objectives

- Develop a differential diagnosis for signs/symptoms of catatonia
- Understand how catatonia exam fits into normal MSE exam
- Understand treatment approaches to catatonia, including new treatment approaches

Case of Malignant Catatonia

- 40 yo woman with a PMH of morbid obesity, bipolar disorder type 1 with previous catatonic episodes, and HTN
- Presented to an OSH with confusion, bizarre behaviors and AMS, was empirically treated for bacterial meningitis.
- Developed a significant drug reaction, Acute Generalized Exanthematous Pustulosis (AGEP), and was transferred to JHBMC Burn Unit for management of open wounds
- Treated in the Burn Unit with steroids and wound care with significant improvement.
- **PE: unresponsive, nonverbal, staring blankly forward**
- Diagnosed with **malignant catatonia** based on presence of fevers, tachycardia, catatonic syndrome, prior episodes of catatonia

Case Continued

- Restarted on Depakote and treated with Lorazepam 4mg x 5 times a day with no improvement in mental status. Initially responded to Lorazepam with some movement, however responsiveness faded with repeat administrations.
- ECT recommended, family declined, very vexing for treatment team
- After 6 weeks of having catatonia, patient got better
- Hospital stay was complicated by MRSA bacteremia, Serratia CAUTI, and decubitus ulcers

Andy Francis – Penn State

<https://sites.psu.edu/catatonia/about-us/>

Andrew Francis, PhD, MD

Director



Dr. Andrew Francis serves as director of this program. He is currently Professor of Psychiatry at Penn State Medical School/Hershey Medical Center, where he is the director of Neuromodulation Services and Associate Director of Residency Training.

Dr. Francis received a PhD in Psychology from SUNY Stony Brook,

served as a postdoctoral research fellow at Cornell Medical School, obtained an MD from the University of Buffalo, and completed residency training at Johns Hopkins Hospital.

Catatonia Information Center

Penn State University

Search

Mission and Goals

What is Catatonia?

Recognizing Catatonia

Treating Catatonia

Additional Information

Videos About Catatonia

News & Updates

Forum: Q&A

About Us

Contact Us

Support Us

What is Catatonia?

January 24, 2017

Catatonia is a distinct neuropsychiatric syndrome that is becoming more recognized clinically and in ongoing research. Its main clinical features are abnormalities on motor behaviors, including being immobile, not speaking, or having unusual movements out of context to the environment. Abnormality [e.g. fever, diaphoresis, tachycardia, hypertension] in autonomic functions is characteristic of the more severe forms, referred to as malignant catatonias.

In its classic full form, where mutism, posturing, and stupor are present, catatonia is readily recognized. In many cases, however, its less dramatic features are more subtle, intermittently present, or misidentified.

Catatonia can be seen along with psychiatric, metabolic, or neurologic conditions. It may occur in many forms, including neuroleptic malignant syndrome.

Treatment with benzodiazepines or electroconvulsive therapy leads to a dramatic and rapid response, although systematic, randomized trials are lacking.

This website for the Catatonia Program is designed to provide information to patients, families, and medical professionals on a range of topics about catatonia.

What is Catatonia?

- Cata = down/against (Greek) / Tonos = tone or tension
- Usually characterized by the inability to move normally
- It is not a diagnosis but a syndrome (we must discover the etiology in each case)
- NOT a separate diagnostic entity – a descriptor for certain disease processes, like “delirium with catatonic features or bipolar disorder with catatonic features”
- Catatonia has multiple subtypes and in fact is a lot of different syndromes !!!

MSE of a Catatonic Patient

- Appearance – Limited blinking, catalepsy (frozen pose)
- Behavior – withdrawn or overly impulsive/frenzied
- Motor – rigidity, negativism (contrary to what you ask), automatic obedience (mitgehen), echopraxia
- Speech – echolalia, verbigeration, mute
- Mood/PDW/SI/AVH/thought content -- *all subjective (not helpful for catatonia exam)*
- Insight/judgment typically poor

Epidemiology

- Reported incidence is approximately 10% in hospitalized acutely ill psychiatric patients, higher in patients referred for ECT.
- Most commonly occurs in unipolar depression and bipolar disorder with psychotic features in psychiatry.
- In 100 cases catatonia, 80 are due to psychiatric reasons, 20 due to medical reasons. Of the medical reasons, 13/20 are due to neurological causes.

Diversity of Catatonia Phenotype

“Mathematically, 4017 unique symptom combinations exist that would yield a catatonia diagnosis” – Oldham editorial, the *Lancet*

Decreased Motor
/ Hypokinetic

Abnormal Motor
Behaviors such as
Posturing/stereotypies/
mannerisms (salutes)

Malignant

Increased motor
/hyperkinetic

Delirium also has many subtypes – it should not be surprising that Catatonia does too!

What does catatonia look like? Hypokinetic

1. Immobility/stupor: Extreme hypoactivity, immobile, minimally responsive to stimuli.

0 - Absent.

1 - Sits abnormally still, may interact briefly.

2 - Virtually no interaction with external world.

3 - Stuporous, non-reactive to painful stimuli.

2. Mutism: Verbally unresponsive or minimally responsive.

0 = Absent.

1 = Verbally unresponsive to majority of questions; incomprehensible whisper.

2 = Speaks less than 20 words/5mins.

3 = No speech.

3. = Staring: Fixed gaze, little or no visual scanning of environment, decreased blinking.

0 = Absent.

1 = Poor eye contact, repeatedly gazes less than 20 s between shifting of attention; decreased blinking.

2 = Gaze held longer than 20 s, occasionally shifts attention.

3 = Fixed gaze, non-reactive.

13. Withdrawal: Refusal to eat, drink and/or make eye contact.

0 = Absent.

1 = Minimal oral intake/interaction for less than 1 day.

2 = Minimal oral intake/interaction for more than 1 day.

3 = No oral intake/interaction for 1 day or more.

- Very difficult to distinguish from hypoactive delirium
- 30% of patients who are delirious have catatonic features and vis-a-versa
- Get an EEG to distinguish catatonia vs. delirium

Viceroy's in the Garden with the Monarch Butterflies: Medical Mimics of Catatonia.

Brendan Carroll



Monarch

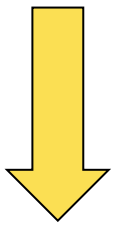


Viceroy

DDM (Disorders of Diminished Motivation) – no impulse towards action

Hypokinetic Catatonia

- Mutism
- Inhibited movement
- Posturing
- Withdrawal
- Staring



Mood disorders, Medical Disorders (usually neurological), Psychosis

Akinetic Mutism

- “Makes no sound and lies inert”
- “His steady gaze gives promise of speech but patient is mute or answers in whispers”
 - Case Report ***Akinetic Mutism*** by David Daly and J Grafton Love, MD *Neurology Magazine*



Lesion in bilateral mesial frontal lobes, organic brain injury


Parkinsons’ Plus Syndrome

- Rigidity
- Bradykinesia
- Aphasia
- Withdrawal



Inclusions in neurons – tauopathies, ect

Viceroy's in the Garden With the Monarch Butterflies: Medical Mimics of Catatonia

Alexandre Yacques, OMS-IV, DO,* Alexander Culver, MS-III,†
Alexander LaFever, MD,† and Brendan T. Carroll, MD‡ 

| Age/ID | DX | BRCRS Total | KANNER Part II Part III | DSM- 5-TR | TX | LOS | Complication | MIMIC | SX KANNER Part I |
|--------|---------------------|----------------|----------------------------|--------------|---------------------------------------|-------|--------------|-------|---|
| 56 M | DDM | + 7 | + 12 3 | - | Bromocriptine Thiamine | 12 d | ETOH rehab | + | 3 Immobility, mutism, refusal to eat and drink |
| 80 F | DDM | + 22 | + 36 8 | + | Lorazepam Memantine Transfusion | 13 d | PT rehab | + | 5 Immobility, negativism, mutism, staring, refusal to eat and drink |
| 71 F | Toxic-Cephalosporin | + 28 | + 24 5 | + | Lorazepam | 9 d | UTI | - | 3 Immobility, mutism, refusal to eat or drink |
| 33 F | Toxic-Meth induced | + 26 | + 28 4 | + | Lorazepam | 2 d | Sub Rehab | - | 5 Immobility, negativism, mutism, refusal to eat and drink |
| 71 F | Stroke | + 21 | + 18 8 | + | Lorazepam | 8 d | PT | - | 3 Immobility, negativism, refusal to eat and drink |
| 69 M | Delirium | + 12 | + 38 0 | + | Olanzapine | 23 d | Dialysis | + | 6 Immobility, negativism, mutism, staring |
| 66 F | Delirium | + 13 | + 10 7 | + | Lorazepam | 7 d | Infection | + | 3 Immobility, negativism, refusal to eat and drink |
| 30 M | Schizophrenia | + 21 | + 16 3 | + | ECT | 111 d | Group home | - | 5 Agitation, negativism, mutism, impulsivity |
| 43 M | Schizophrenia | + 7 | + 10 3 | + | AP + Lorazepam | 35 d | Group home | - | 4 Immobility, negativism, staring, refusal to eat and drink |

Abnormal Motor Signs - Catatonia

4. Posturing/catalepsy: Spontaneous maintenance of posture (s), including mundane (e.g. sitting or standing for long periods without reacting).

0 = Absent.

1 = Less than 1 min.

2 Greater than one minute, less than 15 min.

3 Bizarre posture, or mundane maintained more than 15 min.

12. Waxy flexibility: During repositioning of patient, patient offers initial resistance before allowing him/herself to be repositioned, similar to that of a bending candle. (also defined as slow resistance to movement as the patient allows the examiner to place his/her extremities in unusual positions. The limb may remain in the position in which they are placed or not)

0 - Absent

3 - Present.

16. Automatic obedience: Exaggerated cooperation with examiner's request or spontaneous continuation of movement requested.

0 = Absent.

1 = Occasional

2 = Frequent

3 = Constant.

“let me put a pin in your tongue”

17. Passive Obedience (mitgehen): Patient raises arm in response to light pressure of finger, despite instructions to the contrary.

0 = Absent.

3 = Present.

Lift arm while saying “don't let me lift your arm”



Catalepsy – psychological pillow

Catatonia and Autism

DSM-5 AUTISM SPECTRUM DISORDER

GUIDELINES & CRITERIA EXEMPLARS

7. Stereotypy: Repetitive, non-goal-directed motor activity (e.g. finger-play, repeatedly touching, patting or rubbing self); abnormality not inherent in act but in its frequency.

- 0 - Absent
- 1 - Occasional.
- 2 - Frequent.

8. Mannerisms: Odd, purposeful movements (hopping or walking tiptoe, saluting passers-by or exaggerated caricatures of mundane movements); abnormality inherent in act itself.

- 0 - Absent
- 1 - Occasional.
- 2 - Frequent.
- 3 - Constant.

6. Echopraxia/echolalia: Mimicking of examiner's movements (echopraxia) or speech (echolalia).

- 0 = Absent
- 1 = Occasional.
- 2 = Frequent.
- 3 = Constant

5. Grimacing: Maintenance of odd facial expressions.

- 0 = Absent.
- 1 = Less than 10seconds.
- 2 = Less than 1 min.
- 3 = Bizarre expression(s) or maintained more than 1 min.

B. RESTRICTED, REPETITIVE PATTERNS OF BEHAVIOR, INTERESTS, OR ACTIVITIES AS MANIFESTED BY AT LEAST 2 OF 4 SYMPTOMS:

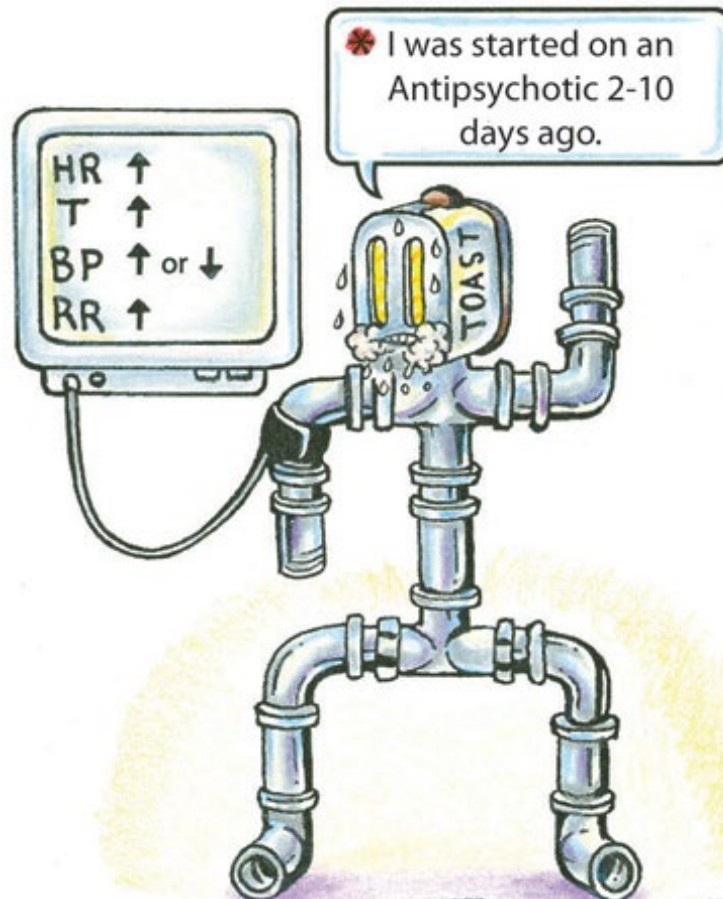
B1. Stereotyped or repetitive speech, motor movements, or use of objects; (such as simple motor stereotypies, echolalia, repetitive use of objects, or idiosyncratic phrases).

- *Stereotyped or repetitive motor movements*
 - Repetitive hand movements (e.g., clapping, finger flicking, flapping, twisting)
 - Stereotyped or complex whole body movements (e.g., foot to foot rocking, dipping, & swaying; spinning)
 - Abnormalities of posture (e.g., toe walking; full body posturing)
 - Intense body tensing
 - Unusual facial grimacing
 - Excessive teeth grinding
 - Repetitively puts hands over ears (*note: if response to sounds, consider B4*)
 - Perseverative or repetitive action / play / behavior (*note: if 2 or more components, then it is a routine and should be considered under B2*)
 - Repetitive picking (unless clear tactile sensory component, then consider B4)

ECT for Autism with self-injury: Do these patients have catatonic features?

Malignant Catatonia

- DDX includes Neuroleptic Malignant Syndrome



Malignant

- Fever
- Autonomic instability
- Tachycardia
- Tachypnea
- Diaphoresis
- Rigidity – lead pipe
- Delirium
- Leukocytosis
- Elevated CK
- Low serum Iron

Etiology of Catatonia

- Neurological injury
 - Seizures
 - CNS structural damage
 - Encephalitis or other CNS infection
- Psychiatric Illness
 - MDD
 - Bipolar Disorder
 - Psychosis

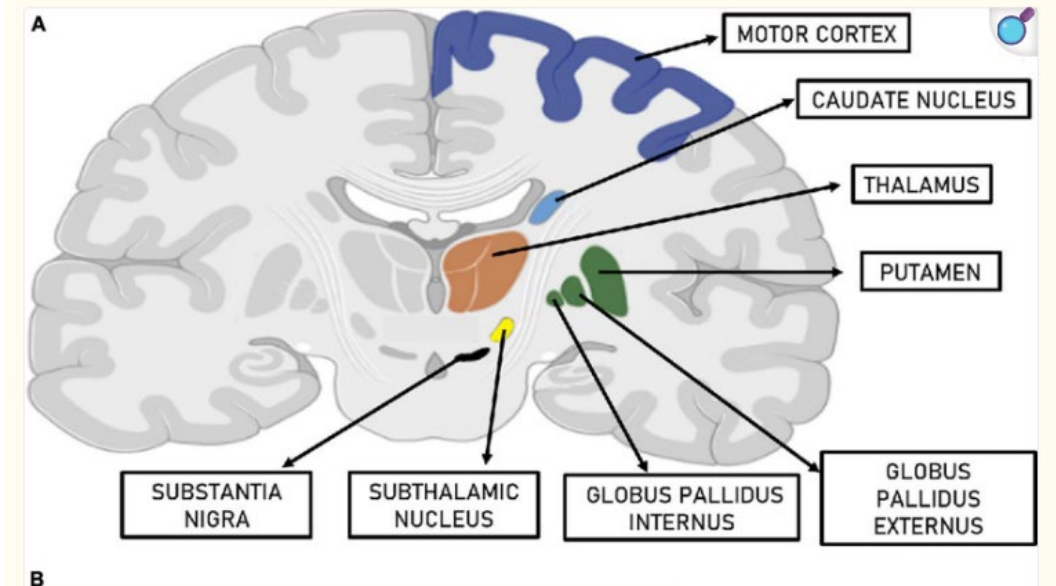
DSM-5:

- Catatonia associated with another mental disorder OR Catatonic Disorder due to another medical condition

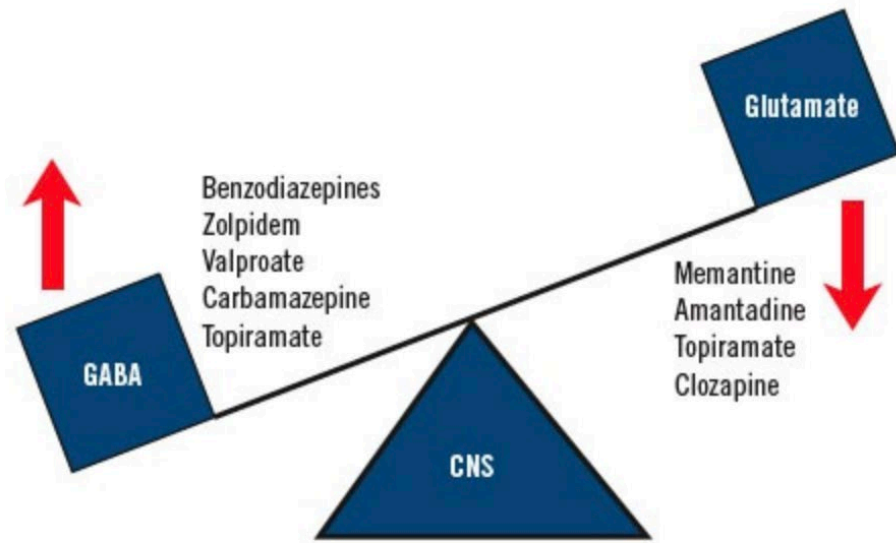
Pathophysiology Hypothesis – Low Dopamine in BG and cortex and cortex

- Alterations in motor circuits involving BG and cortex → leads to relative low dopamine tone
- Dopaminergic pathways disrupted especially in hypokinetic catatonia – dopamine very important for movement and initiation of movement is disrupted in catatonia

FIGURE 1.



Pathophysiology Hypothesis – decreased GABAergic tone



According to this hypothesis, pharmacologic treatment tend to restore GABA-glutamate imbalance, decreasing glutamate transmission or increasing GABA transmission. Decrease of dopaminergic transmission may act indirectly, increasing GABA-glutamate imbalance.

GABA= γ -aminobutyric acid; CNS=central nervous system.

Carroll BT, Lee JWY, Appiani F, Thomas C. *Primary Psychiatry*. Vol 17, No 4. 2010.

- Disruption in the balance of GABAergic tone (too little) and Glutamatergic tone (too much)
- This is why NMDA receptor antagonists have clinical utility (amantadine, memantine)

Treatment Algorithm (adapted from Scott Beach, MD *Step by Step through Catatonia Algorithm, YouTube*)

IV lorazepam

- 2 mg IV (quick onset), may repeat 2-3 times
- Work up for ECT (legal, family discussions)

ECT Trial

- 6-10 sessions

Add NMDA-R antagonists

- Amantadine 100 – 600 mg daily (over 5 days) OR
- Memantine 10-20 mg daily (over 3-4 days)

Treatment Algorithm (adapted from Scott Beach, MD *Step by Step through Catatonia Algorithm, YouTube*)

Add GABAergic
anticonvulsant

- Carbamazepine 300 mg OR
- Valproic acid 1500 mg

Add atypical antipsychotics:
because of 5HT_{1A} agonism
and 5HT_{2A} antagonism,
they increase DA in
prefrontal cortex

- Aripiprazole 10 – 30 mg OR
- Olanzapine 2.5 – 10 mg OR
- Clozapine

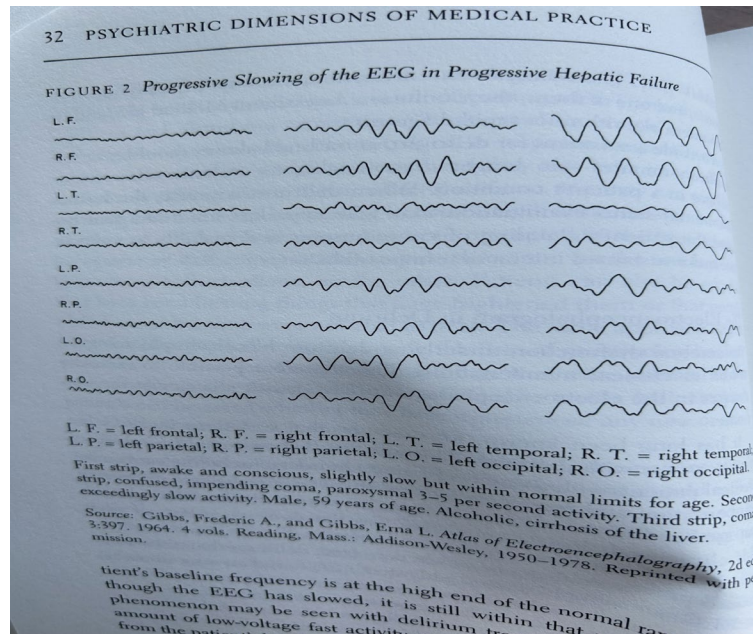
Case 1

- 79 M with HTN, CAD, Afib on AC, CKD Stage III, DM2, hypothyroidism presented to JHBMC s/p falling backwards and hitting his head on the bathtub. Psych hx significant for single episode of severe depressive disorder treated with ECT in 2018. In the past several weeks, patient had **increased restlessness at night, with him going through drawers, throwing out clothes, talking about deceased child as if she were alive, wondering why God made people the way they are.**

Case 1 continued

- Recent psychiatric med changes: Stopped Abilify due to TD. Started Ingrezza. Decreased Mirtazapine from 30 mg to 7.5 mg over the past 8 weeks.
- On admission to the hospital, his labs were fairly benign but his speech was: ***“God forgave me because I was Jesus and my father was Izzy Cohen a coin dealer and I collect coins. They had to protect the wall, the top of your buildings with a cover. You know the Art Museum and the National Aquarium? They took the covers off to protect them. They are going to burn them down the National Aquarium. They are covered down, all the buildings, because Donald Trump in 2022. I can see the buffalo and the deer and the antelope and bears.”***

Case 1 Continued

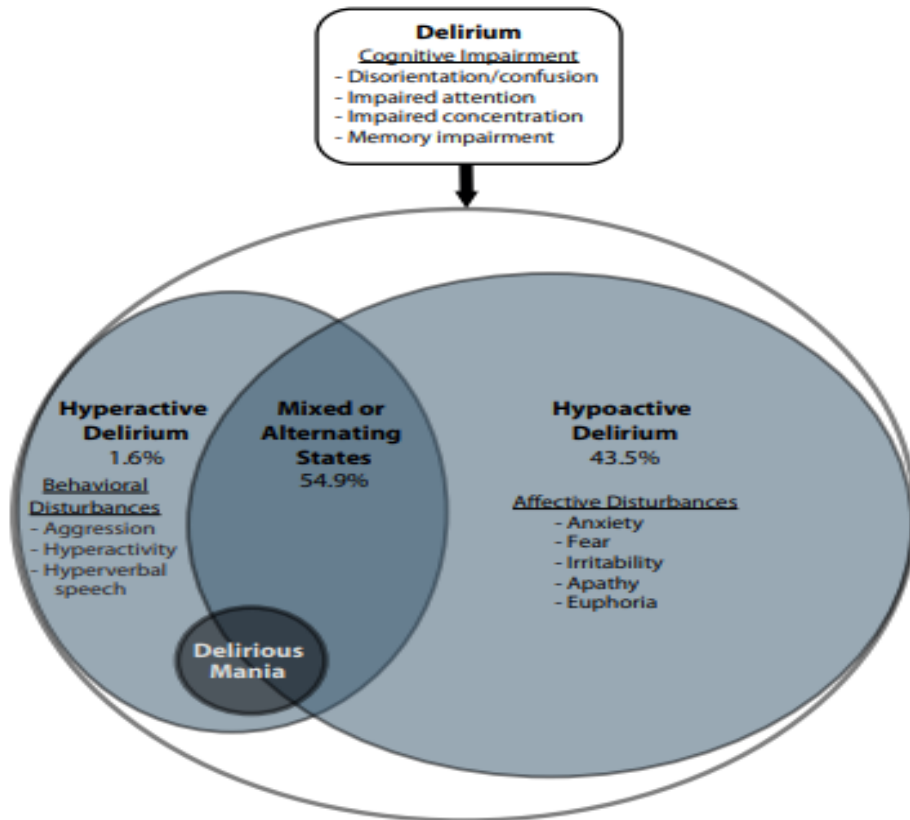


Work-up

- Requested EEG – EEG can rule in delirium because the EEG in delirium shows “diffuse and symmetric slowing of electrical activity on EEG”
- Hyperactive delirium was working diagnosis as MMSE 19/30 and RN reports of “no sleep whatsoever”
- But he started repeating several phrases and I was wondering about verbigeration (constant repetition of nonsense words, word salad, like a scratched record)

Delirium + Mania = Delirious Mania

Figure 1. Diagram of Delirium: The Relationship Among Affective, Behavioral, and Cognitive Components



- “Acute onset of excitement, grandiosity emotional lability, delusions and insomnia characteristic of mania and the disorientation and alterations of consciousness characteristic of delirium
- Alternates between signs of psychosis, catatonia, delirium, mania

Case 1

- We are still waiting on EEG
- Should we give him IV lorazepam – when treating catatonia and delirium, some guidelines recommend starting with NMDA-receptor antagonists before lorazepam given that delirium typically worsens with lorazepam

Why Treat Catatonia?

- Malignant Catatonia is a medical emergency!
- Bed sores/urinary tract infections/poor PO intake leads to weakness/debility
- Therapist recall of patient's experience: "I remember knowing that I needed to reach for the shampoo, but not being able to..."
- Catatonia is a morbid condition – not all states or medical systems have ECT and ECT is the most effective treatment (85% effective)