

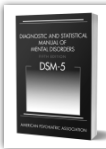
# ANESTHETIC IMPLICATIONS OF PSYCHIATRIC DISORDERS

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## DSM-5


- Most common DSM diagnosis amongst US adults
  - Anxiety Disorders (48 million people)
  - Eating Disorders (7-10% of adults)
  - Major Depression (21 million people)
  - Alcohol Use Disorder (14.5 million people)
  - Post Traumatic Stress Disorder (9 million people)
  - Bipolar Disorder (7 million people)
  - Borderline Personality Disorder (3.5 million people)
  - Obsessive Compulsive Disorder (3 million people)
  - Schizophrenia (1.5 million people)

National Alliance on Mental Health



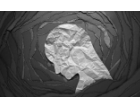
## REMEMBER ...

- Create a calm setting
- Work with the patient to assess their status
- If there's a caregiver, get them involved
- Explain what is happening
- Help the patient to understand why they are there for a procedure
- Keep the stimuli to a minimum
- Create an anesthetic plan from pre-op to intra-op to PACU
- Communicate with your team on their roles in the continuum of care



## ANXIETY DISORDERS


- An emotion characterized by feelings of tension, worried thoughts, and physical changes like increased blood pressure
- Usually involves recurring intrusive thoughts or concerns
- Avoidance of certain situations out of worry
- Can have physical symptoms such as sweating, trembling, dizziness, or rapid heartbeat



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## ANXIETY DISORDERS

- Anxiolytics
  - Second most prescribed psychotropic medication
  - Patients historically prescribed barbiturates but they have largely been replaced by benzodiazepines
  - Side effects
    - Sedation, cognitive impairment, psychomotor impairment, respiratory depression, anterograde amnesia
    - Drug interactions: Kava St John's Wort




## ANXIETY DISORDERS

- Anxiolytics
  - Benzodiazepines (Kanax, Ativan)
    - Action on CNS by binding to the GABA-A receptor
    - Subsequently increasing the frequency of opening of the associated chloride channel resulting in hyperpolarization of neurons and reduced excitability
    - Highly lipid soluble resulting in rapid onset of action
    - Effects: sedation, amnesia, anxiolytic, and anticonvulsive activity
    - Metabolized in liver and excreted in urine




## ANXIETY DISORDERS

- Anxiolytics
  - Benzodiazepines: Implications
    - May produce myocardial depression and hypotension when co-administered with opioids
    - Decrease ventilatory response to carbon dioxide
    - Reduce cerebral blood flow
    - Postoperative delirium common
    - Propofol reduces clearance by 37%
    - Fentanyl reduces clearance by 30%
    - Reduces MAC requirement by 30%




## ANXIETY DISORDERS

- Anxiolytics
  - Barbiturates (Secobarbital)
    - Action similar to Benzodiazepines
    - Increase the duration of channel opening
    - Not anticonvulsive making it useful for ECT
    - Largely replaced by use of Benzodiazepines and Propofol
  - Implications
    - Acute use will decrease anesthetic requirements
    - Chronic use will increase anesthetic requirements
    - High degree of hypotension and respiratory depression



## ANXIETY DISORDERS

- Anxiolytics
  - Barbiturates Implications Cont.
    - Avoid use in pts with intermittent porphyria
    - May lead to broncho spasm during laryngoscopy in patients with asthma
    - Withdrawal can lead to life threatening seizures, anxiety, tremor, agitation and hypotension and may develop 2-8 days following discontinuation
    - Overdose manifests with sedation, coma, respiratory depression, and hypotension
    - Unlike Benzodiazepines, there is no reversal drug



### EATING DISORDERS


- Characterized by abnormal eating habits that can threaten an individual's health or life
- They include:
  - Anorexia nervosa: restricted eating to the point of starvation
  - Bulimia nervosa: individuals eat excessive amounts of food then purge by self-induced vomiting or use of laxatives
  - Binge eating: out-of-control eating patterns but do not purge

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### EATING DISORDERS

- Implications
  - Associated with hypotension, bradycardia, hypoventilation, slow metabolism, delayed gastric emptying, electrolyte imbalances, cortisol increase, and anxiety
  - May include multiple organ system impairment or failure
  - Anesthesia may cause dose-dependent organ system failure
  - Considerations like: reduced lung elasticity, reduced immune function, anesthetic induced arrhythmias, etc.



### EATING DISORDERS

- Implications
  - Thorough preoperative evaluation needed to assess abuse of substances such as laxatives, diuretics, amphetamines, etc.
  - Must be rehydrated and electrolyte abnormalities corrected
  - Patients usually have gastric dilatation so a nasogastric tube is indicated to prevent possible aspiration
  - Rapid sequence induction indicated
  - Active patient warming a must
  - Vigilance during positioning necessary to prevent peripheral nerve injuries




### DEPRESSION

- Classified as Mild, Moderate, Severe
- Major Depressive Disorder
  - Affects 21 million people
  - Many experience a lack of interest and pleasure in daily activities
  - Weight loss or gain
  - Insomnia or excessive sleeping
  - Lack of energy
  - Inability to concentrate
  - Feelings of worthlessness or guilt
  - Thoughts of death or suicide
  - Affects one's ability to engage in activities of daily living




### DEPRESSION

- Implications
  - Could be suicidalist
  - Could be a danger to self or others
  - Possible self injury or self-destructive behavior
  - Possible substance abuse
  - May complain of severe headache or abdominal pain
  - May refuse to communicate or interact
  - May refuse to cooperate




### DEPRESSION

- Antidepressants
  - 4 types
    - Tricyclic Antidepressants (TCA)
    - Selective Serotonin Reuptake Inhibitors (SSRI)
    - Serotonin-Norepinephrine Reuptake Inhibitors (SNRI)
    - Monoamine Oxidase Inhibitors (MAOI)
  - Generally continued in the perioperative period to prevent relapse of symptoms and withdrawal




### DEPRESSION

- Antidepressants
  - Discontinuation Syndrome
    - Abrupt cessation of antidepressant
    - Associated with developing withdrawal symptoms
    - Common symptoms include nausea, abdominal pain, diarrhea, sleep disturbance, somatic symptoms (sweating, lethargy, and headache) and affective symptoms (low mood, anxiety, irritability)
    - Reactions start abruptly within a few days of cessation and end if the antidepressant is reintroduced




### ANTIDEPRESSANTS

- Tricyclic Antidepressants
  - Primary mechanism of action is through serotonin and norepinephrine reuptake inhibition
  - Side effects
    - Anticholinergic (sedation, urinary retention, constipation, prolonged gastric emptying, dry mouth, blurry vision, confusion, delirium)
    - Direct myocardial depression
    - Tachycardia
    - Arrhythmias
    - ECG interval prolongation
    - Orthostatic hypotension
    - Lower seizure threshold
    - Sexual dysfunction




### TRICYCLIC ANTIDEPRESSANTS

- Anesthetic implications
  - Caution in patients with preexisting arrhythmias
  - Seizure: avoid meperidine
  - Serotonin syndrome: avoid meperidine, methadone, and fentanyl, tramadol, ondansetron, metoprolol, metoprolol, 3 John's Wort
  - Hypertension: avoid sympathetic stimulation and ketamine
  - Sedation: avoid additional anticholinergics (atropine and scopolamine)
  - Increased MAC requirements
  - Multimodal analgesia and regional anesthesia without epinephrine when possible



### TRICYCLIC ANTIDEPRESSANTS

- Serotonin syndrome
- Can occur when TCAs are combined with other serotonergic medications
- Triad of Serotonin Syndrome
  - Mental status changes such as agitation and confusion
  - Autonomic instability, including hyperthermia
  - Neuromuscular abnormalities such as hyperreflexia and rigidity



### ANTIDEPRESSANTS

- Serotonin Reuptake Inhibitor (SSRIs)
  - Generally considered first-line treatment because they tend to be well tolerated
  - Mechanism of action includes inhibition of CYP-450 enzymes
  - Minimal anticholinergic properties, sedative effects, and orthostatic hypotension
  - Milder side effect profile



### SEROTONIN REUPTAKE INHIBITOR

- Side Effects
  - Milder side effect profile compared to TCAs and MAOIs
  - Little to no anticholinergic or cardiotoxicity
  - Decreased risk of fatal overdose
  - Primary side effects include
    - Headache
    - Nausea
    - Tremor
    - Agitation
    - Insomnia
    - Sexual dysfunction




### SEROTONIN REUPTAKE INHIBITOR

- Anesthetic Implications
  - Abnormal bleeding
  - Serotonin syndrome
  - Hypertension
  - GI prolongation
  - Increased duration of action of benzodiazepine and neuromuscular blocking agents




### ANTIDEPRESSANTS

- Monoamine Oxide Inhibitors
  - Reserved for resistant depression due to toxicity profile and dietary restrictions
  - Mechanism of action includes inhibiting oxidative deamination of amines, thereby increasing concentrations of MAO substrates including norepinephrine, serotonin, and dopamine




### MONOAMINE OXIDE INHIBITORS

- Anesthetic Implications
  - Hypertensive crisis
    - Avoid indirect acting vasopressors (epinephrine, ketamine, & local anesthetics containing epi)
  - Serotonin syndrome
  - Prolonged neuromuscular blockade with Succinylcholine
  - Multimodal analgesia and regional anesthesia when possible



### SUBSTANCE USE DISORDER


- Chronic brain disease characterized by the recurrent use of substances including alcohol and drugs
- Disrupts and brain's normal circuit of reward, withdrawal, memory, and motivation causing progressive neurological and physiologic changes related to judgement, decision making, learning, memory, and behavior control.
- Can be classified as mild, moderate, or severe depending on level of impairment.



AANA

### SUBSTANCE USE DISORDER


- Anesthetic Implications
  - Patients may present for anesthesia and analgesia acutely intoxicated or in withdrawal, in early stages of treatment, or in drug-free recovery
  - No absolute contraindication to treatment with controlled substances such as anesthetics and opioids; however, precautions should be taken to mitigate or avoid exposure to these substances to prevent relapse



AANA

### SUBSTANCE USE DISORDER


- Anesthetic Implications
  - Be aware of increased risk of patient complications such as
    - Aspiration
    - Generalized edema
    - Compromised airway
    - Venous thrombosis
    - Subcutaneous abscess
    - Lymphadenopathy
    - Hepatomegaly
    - Hemodynamic instability
    - Encephalopathy



AANA

### SUBSTANCE USE DISORDER


- Anesthetic implications
  - When acute opioid use is known, consider potential for increased tolerance to opioids and anesthetics which may require higher than normal doses.
  - Mitigate opioid use and incorporate drugs with minimal or no hepatic metabolism, when possible
  - If patient presents intoxicated, debay or reschedule anesthesia, if possible



ANVA

### POST TRAUMATIC STRESS DISORDER


- An anxiety disorder that develops in some people following an extremely traumatic event or during exposure to long-term chronic stressful situations
- Individuals may relive the event or events through intrusive memories, flashbacks, and nightmares
- Avoid anything that reminds them of the trauma
- Have anxious feelings they didn't have before
- Can involve a disruption in their lives



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### POST TRAUMATIC STRESS DISORDER

- Anesthetic implications
  - Potential perioperative issues
    - Distrust of people
    - Separation anxiety
    - Refusal to communicate or interact
    - Possible substance abuse
    - Possible suicidal thoughts
  - Agitation
  - Aggression
  - Intubility



### POST TRAUMATIC STRESS DISORDER

- Anesthetic Implications
  - Emergence delirium characterized by
    - Agitation
    - Confusion
    - Aggressive behavior
    - Thrashing in bed
    - Pulling out IVs
    - Pulling out airways
    - Assaulting hospital staff
  - Increased anesthetic requirement due to overactivation of sympathetic system



Timing of care	Standard practice	PTSD treatment recommendations
Preoperative assessment	PTSD not a consideration No special significance given to psychiatric medications on resuscitation Patient teaching does not include preparation for emergence agitation	Include specific history of PTSD in assessment Alert to psychiatric medications, especially those prescribed for nightmares Focus patient teaching on emergence agitation and interventions
Intraoperative concerns	Standard use of benzodiazepines Avoidance of ketamine when PTSD is known in history No routine pharmacologic interventions to reduce risk of emergence agitation	Avoid use of benzodiazepines, particularly midazolam No need to avoid use of ketamine Intraoperatively administer dexmedetomidine, dexmedetomidine, droperidol, promethazine
After anesthesia to discharge	No attention paid to PACU noise level Staffing based on availability No psychiatric referrals	Provide a minimally stimulating environment Employ the principle of consistency Refer to RESPECT-AM and other appropriate programs

Table. Proposed Perioperative Care for Soldiers With Posttraumatic Stress Disorder  
Abbreviations: PACU, postanesthesia care unit; PTSD, posttraumatic stress disorder; RESPECT-AM, the Engineering Systems of Primary Care Treatment in the Military.

### BIPOLAR DISORDER


- A serious mental illness in which common emotions become extremely and often unpredictably magnified
- Moods can quickly swing from extremes of happiness, energy, and clarity to sadness, fatigue, and confusion
- Involves manic episodes
  - Abnormally elevated or irritable moods
  - Last at least a week
  - Impair functioning
  - Not all become depressed



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### BIPOLAR DISORDER

- Thought to be related to excessive norepinephrine in the brain
- Lithium
  - Interferes with Na ion transport with effects on many signaling pathways in the brain affecting neurotransmitter release
- Other common medication treatments include Valproic Acid, Carbamazepine, and Lamotrigine
- Concomitant administration of an antipsychotic (Haloperidol) or a benzodiazepine (Lorazepam) is usually necessary during acute mania
- ECT is also a commonly utilized treatment




### BIPOLAR DISORDER

- Lithium
  - Gold standard treatment due to its antimanic, antidepressant, and antisuicidal effects
  - Mechanism of action poorly understood
  - Has narrow therapeutic window
    - Optimal serum levels 0.6-1.2 mmol/L
    - Dose ranges from 600-1200 mg daily
    - When serum levels exceed 1.5 mmol/L, lithium toxicity occurs
      - Confusion, sedation, muscle weakness, tremors, and slurred speech, seizures
      - ECG changes of sinus node dysfunction, AV block, or T wave changes




### BIPOLAR DISORDER

- Lithium
  - Anesthetic implications
    - Can decrease MAC requirements due to lithium-blocking transmitter release of norepinephrine, epinephrine, and dopamine
    - Can prolong duration of neuromuscular blockade
    - Dehydration, diuretics, and renal impairment can exacerbate risk of toxicity
    - Should be discontinued 72 hours before surgery
    - If continues, drugs that alter renal clearance should be avoided




### BIPOLAR DISORDER

- Lithium
  - Anesthetic implications
  - ISADs can increase lithium levels by 10-25%
  - EKG should be monitored closely as sinus node dysfunction, AV block, T-wave changes, hypotension, and ventricular irritability can occur with toxicity
  - train-of-four monitoring important as lithium can prolong neuromuscular blockade




### SCHIZOPHRENIA

- A serious mental illness characterized by
  - incoherent or illogical thoughts
  - bizarre behavior and speech
  - delusions or hallucinations, such as hearing voices
- Typically begins in early adulthood
- Thought to be related to an excess of dopaminergic activity in the brain
- Exact etiology yet to be established



### SCHIZOPHRENIA

- Generally treated with antipsychotic medications. Two classifications: Typical and Atypical
  - This distinction depends on their ability to cause extrapyramidal side effects and tardive dyskinesia which is less likely in the atypical group
- Mechanism of action
  - Blockade of postsynaptic brain dopamine D2 receptors
  - 2nd generation atypical APDs have higher affinity for serotonin 5HT2 receptor binding which could account for the lower incidence of side effects




### SCHIZOPHRENIA

- Antipsychotics
  - Typical or Neuroleptics
    - Chlorpromazine
    - Haloperidol
    - Trifluoperazine
  - Side effects
    - Acute dystonia
    - Parkinsonism
    - Tardive dyskinesia



### SCHIZOPHRENIA

- Antipsychotics
  - Atypical
    - Olanzapine
    - Clonazepam
    - Risperidone
    - Amisulpride
    - Quetiapine
    - aripiprazole
  - Do not have a tendency to cause extra pyramidal side effects
  - Mechanism of action
    - Act via D2 receptor blockade
    - Act on other receptors like histamine (H1), serotonin (5HT2), acetylcholine (muscarinic), and alpha adrenergic receptors




### SCHIZOPHRENIA

- Antipsychotics
  - Side effects
    - Anticholinergic
    - Osmotic hypotension
    - QT prolongation
    - Sudden cardiac death
    - Seizure
    - Lowers seizure threshold
    - Neuroleptic Malignant Syndrome




### SCHIZOPHRENIA

- Antipsychotics
  - Neuroleptic Malignant Syndrome
    - Rare but potentially life threatening
    - Caused by adverse reaction to neuroleptics and antipsychotic drugs
    - 0.02-2.4% incidence
    - Causes acute hyperthermia, muscular rigidity, altered mental status, elevated creatine phosphokinase, and autonomic dysfunction
    - Treated by cessation of antipsychotic, Dantrolene, and supportive interventions in ICU
    - Despite clinical similarities with Malignant Hyperthermia, there is no proven association between the two conditions



### SCHIZOPHRENIA

- Anesthetic implications
  - Patient may be uncooperative or communication may be difficult
  - Awareness of side effects and interaction of antipsychotics is a must
  - Brachospasms and persistent hypotension during spinal anesthesia were reported
  - Lancet et al showed that 21% of antipsychotics caused serious side effects as mentioned plus disturbances in cardiovascular and autonomic nervous systems
  - Hypotension and tachycardia common



### SCHIZOPHRENIA

- Anesthetic implications
  - Patients generally present with
    - Cardiovascular disease
    - Increased body weight
    - Diabetes mellitus
    - Recent smoking
    - Electrocardiographic changes
    - Sudden cardiac death occurs 10/10,000 patients on antipsychotics
  - Impaired temperature regulation
  - Pain insensitivity
  - Postoperative confusion as a major factor



RESOURCES

- American Psychological Association  
• [apa.org](http://apa.org)
- American Psychiatric Association  
• [psychiatry.org](http://psychiatry.org)
- National Institute of Mental Health  
• [nimh.nih.gov](http://nimh.nih.gov)
- American Association of Nurse Anesthetists  
• [aana.com](http://aana.com)

