

Acute Emergencies in Behavioral Health Patients

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Disclosures

Sponsored Research Disclosures

- Ovid Therapeutics
- Curemark
- Roche
- Stemina
- NIH

Some of the discussion related to medications will be for “off label” use

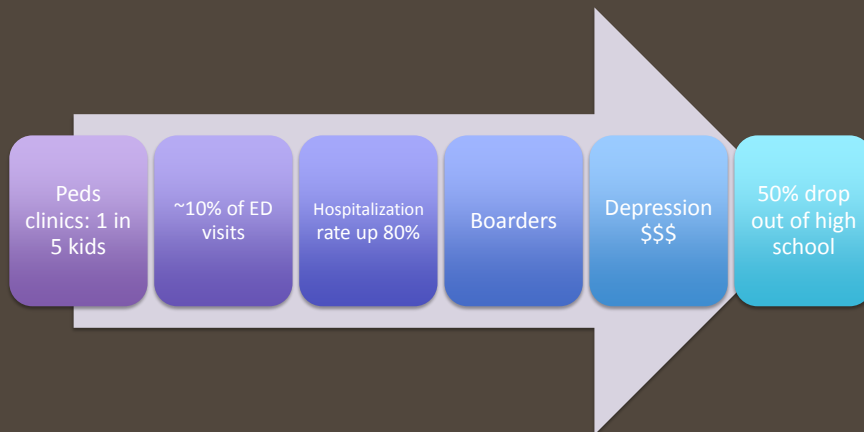
Quick Hits

- Drug Reactions
 - Dystonic Reaction
 - Serotonin Syndrome
 - Neuroleptic Malignant Syndrome (NMS)
- Catatonia
- Suicide Attempts
- Self-injurious Behavior
- Autism Spectrum Disorder
- The Agitated Patient

Goals and Objectives

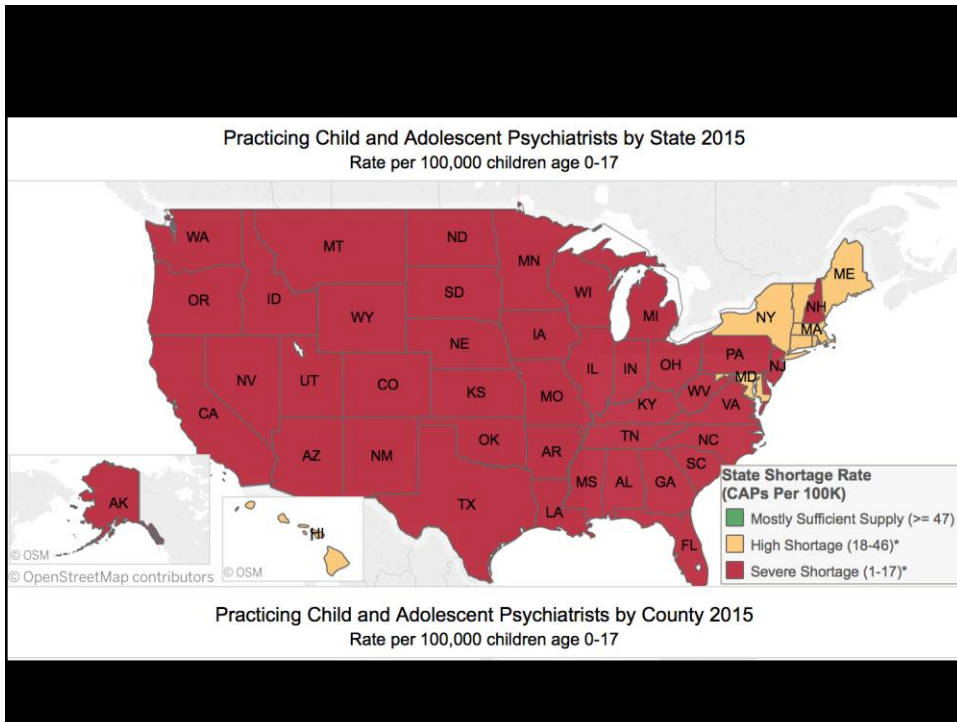
- Identify and manage drug reactions
- Be aware of potential dangers of catatonia
- Assess risks for suicidal behavior
- Understand self-injurious behavior
- Learn nonpharmacologic and pharmacologic treatments for agitation in the hospital

Why Do We Care?



Psychiatric Patients

- Higher 30 day readmission rate
- LOS in ER:
 - ▶ 18.2 hours psych patients
 - ▶ 5.7 hours non-psych patients
- Risks while boarding:
 - Symptom exacerbation
 - Increased anxiety/agitation
 - Elopement → self harm, suicide
 - Increased ancillary resource utilization (officers or sitters)



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Dystonic Reaction

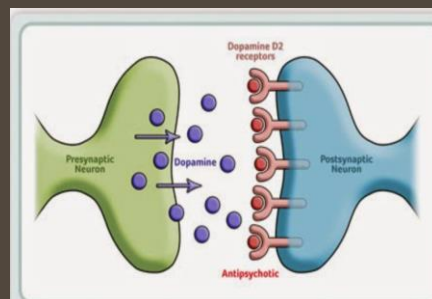
Acute sustained painful muscular contraction

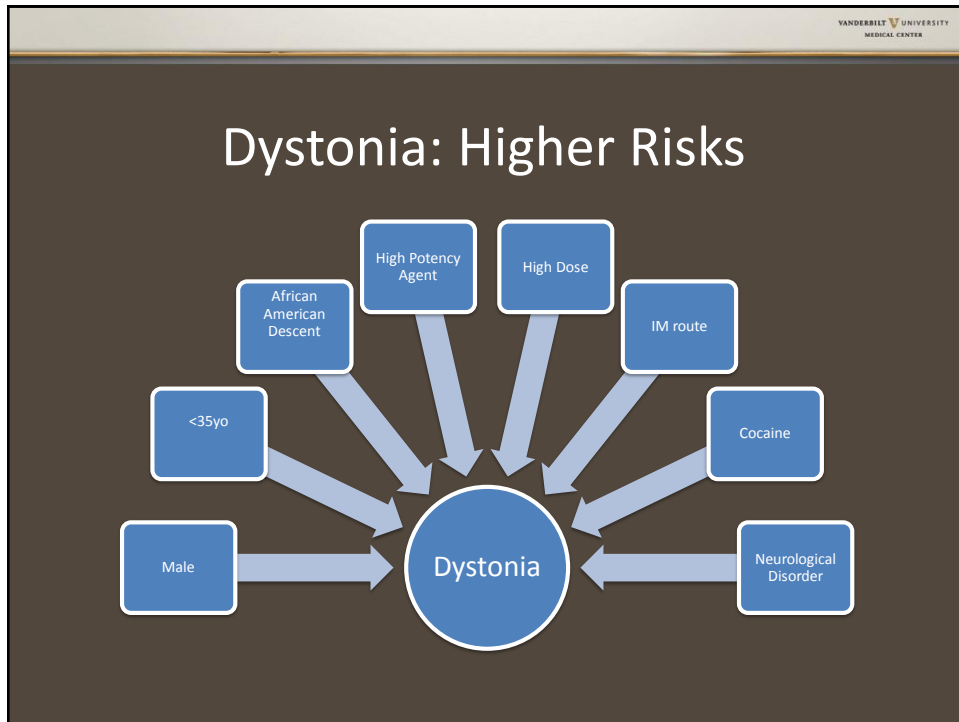
- Blepharospasm
- Tongue protrusion
- Jaw/neck contractions-torticollis
- Back muscles- opisthotonos
- Oculogyric crisis- symmetrical or unilateral upward lateral movement
- Laryngeal dystonia → sudden death



Dystonia

- If due to antipsychotics (DA blockade):
 - 90% Occur within 4 days
 - 100% occur by day 10





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Treatment

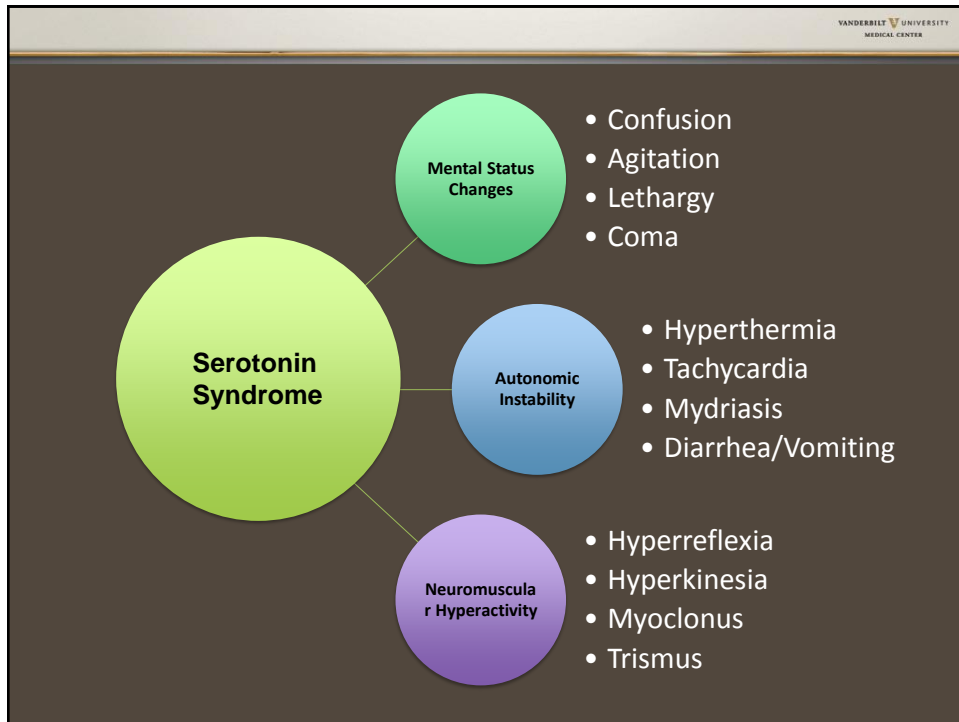
- IV antihistaminergic or anticholinergic agents
- Diphenhydramine 1.25mg/kg/dose IV/IM + oral treatment for duration of half-life of antipsychotic
- Or-
- Benztropine 1-2mg IM/IV with complete resolution within 30 min; repeat with 2nd dose if not complete resolution of symptoms
- * Benztropine reportedly resolves symptoms in less time than Diphenhydramine

A Famous Case

1984, an 18-year-old college freshman died in New York Hospital. Libby Zion was admitted for agitation, confusion, and muscular twitching. She had a history of depression and was taking phenelzine, an MAO inhibitor. The house officers assigned to her care sedated her with meperidine and haloperidol and placed restraints to prevent self-harm. By the following morning, she had a fever of 107 and died from cardiac arrest

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Serotonin Syndrome

- Symptoms can range from mild to severe (death)
- Incidence ~15% of overdoses of SSRIs
- Onset is quick: 3-6 hours
- Most resolve within 24 hours
- Muscle pain and weakness can last for months

Agents That Can Cause Sertoin Syndrome

- **MAOIs:** tranylcypromine, phenelzine, isocarboxazid, moclobemide, nialamide, iproniazid, clorgiline, and toloxatone (antidepressants); pargyline and selegiline (antiparkinsonian agents); procarbazine (antineoplastic); linezolid and furazolidone (antibiotics); Syrian rue (harmine and harmaline—various uses)
- **SSRIs:** fluoxetine, sertraline, paroxetine, fluvoxamine, citalopram, escitalopram
- **SNRIs:** venlafaxine, duloxetine, milnacipran
- **Tricyclic and other antidepressants:** clomipramine, imipramine, trazodone
- **“Mood stabilizers”:** lithium, valproate, risperidone, olanzapine

Agents That Can Cause Serotonin Syndrome

- **Opiates:** meperidine, fentanyl, methadone, tramadol, dextromethorphan,
- **Antimicrobials:** ritonavir, Linezolid
- **Antiemetics:** ondansetron, granisetron, metoclopramide
- **Antihistamines:** chlorphenamine, brompheniramine
- **Antimigraine drugs:** “triptans”
- **Supplements/herbal products:** L-tryptophan, 5-hydroxytryptophan, *Hypericum perforatum* (St. John’s wort), ginseng
- **Stimulants:** amphetamine, 3,4-methylenedioxymethamphetamine (“Ecstasy”)
- **Psychedelics:** lysergic acid diethylamide, 5-methoxy-diisopropyltryptamine

Serotonin Syndrome Treatment

- Discontinue Meds
- Supportive Care (ABCs)
- Cooling Blankets
- Treat Tachycardia + HTN
- Benzos for Anxiety
- Cyproheptadine

Quiz Time!

- All of the following can be associated with serotonin syndrome except:
 - 1) diarrhea
 - 2) hyperthermia
 - 3) delirium
 - 4) “lead pipe” rigidity
 - 5) hyperreflexia

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Neuroleptic Malignant Syndrome (NMS)

- Dopamine blockade
- Develops 2-10 Days
- Mental status changes
 - Agitation, delirium, coma
- Bradyreflexia
- Mnemonic
 - F – Fever
 - A – AMS
 - L – Leukocytosis
 - T – Tremor
 - E – Elevated enzymes (elevated CPK)- 100% cases
 - R – Rigidity of muscles

Neuroleptic Malignant Syndrome (NMS)

- Mortality ~10%
- Tetrad:
 - AMS
 - Hyperthermia
 - Rigidity (“Lead Pipe”)
 - Autonomic Instability:  HR, RR   BP

NMS

- **Typical antipsychotics:** pimozide, droperidol, haloperidol, fluphenazine, trifluoperazine, thiothixene, perphenazine, loxapine, molindone, mesoridazine, thioridazine, chlorpromazine
- **Atypical antipsychotics:** clozapine, olanzapine, risperidone, quetiapine, ziprasidone, aripiprazole
- **Other dopamine blockers:** metoclopramide, prochlorperazine, promethazine

Risk Factors for NMS



Treating NMS

- Discontinue meds
- Circulatory and respiratory support (ICU)
- Treat hyperthermia
 - Cooling blankets
 - Ice packs to axilla
- Dantrolene for muscle rigidity
- Bromocriptine
- Benzodiazepines for agitation
- ECT

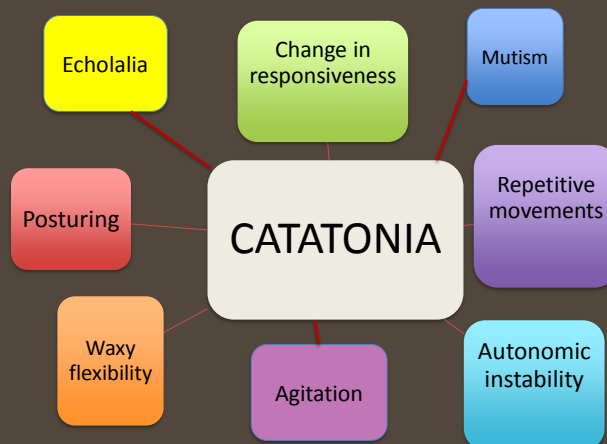
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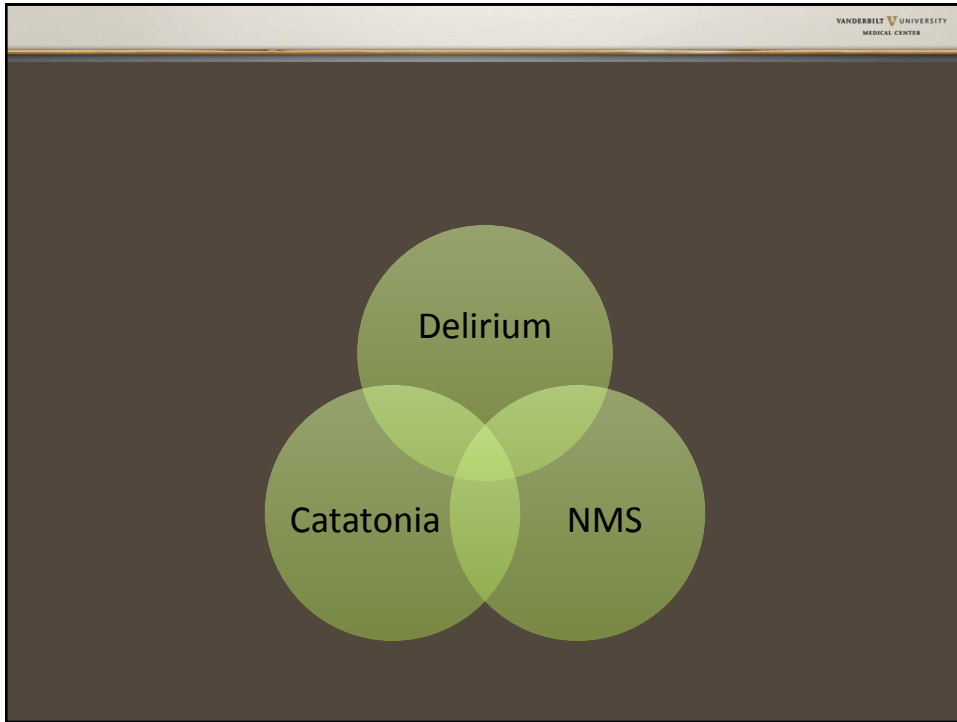
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Catatonia



Features of Catatonia





Catatonia Comorbidities

- Bipolar disorder
- Schizophrenia
- ASD/PDD
- ID
- PTSD
- OCD
- Tic Disorder
- **Medical or Neurological Conditions ~25%**

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Catatonia: Organic Causes

- Medications/toxins
 - Antipsychotics
 - Steroids
 - Lead
- Neurological
 - TBI
 - Encephalitis
 - Seizure disorders
 - CVA
- Medical illness
 - Addison's, Cushing's
 - Lupus
 - Vitamin deficiencies
 - Malaria
 - Pheochromocytoma

Life-threatening Catatonia



Catatonia

- Identify underlying causes
 - Labs: CBC, CMP, thyroid function tests, ANA, inflammatory markers, heavy metals, infectious disease workup, ammonia, iron panel
 - Lumbar puncture, NMDA receptor Ab in CSF
 - Urine porphyrins, homocysteine levels
 - U/A, urine toxicology
 - Ultrasound pelvis
 - Cranial imaging
 - EEG



Catatonia: Treatment




- Identify underlying cause
- Benzodiazepines
 - Test dose Lorazepam 1-2mg IM: response within 30 min
- NMDA antagonists
- ECT



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Increase in Suicide in US

-  24%
- Males and females
-  Females ages 10–14yo
- Males → Firearms
- Females → Poisoning
-  Suffocation
- 2nd leading cause of death

Mechanisms of Suicide

- Firearms > Suffocation (Hanging) > Poisoning
- Suicide *attempts* not increasing
- Method more lethal
- Hanging has doubled in past 15 years

Suicide Trends

- ~20% of teens have ideation
- Higher in rural areas (nearly double)
- 11.9 per 100,000 in rural areas
- 6.5 per 100,000 in urban counties
 - social isolation
 - economic
 - firearms
 - limited mental health and ED access

Suicide Risk Assessment

- Females → Attempt
- Males → Complete
- Adolescents
- Access to weapons
- Current/recent SI
- Plans/Intent
- Attempts
- Self injury
- Substance abuse
- LGBT
- Depression
- Mixed affect/mania
- Insomnia
- Anxiety
- Psychosis

Suicide Risk Assessment

Risk Level	Risk/Protective Factor	Suicidality	Possible Interventions
High	Psychiatric Disorders w/ severe sx; acute precipitating even	Potentially lethal suicide attempt or persistent ideation with strong intent	Admission; suicide precautions
Moderate	Multiple risk factors; few protective factors	SI w/ plan but no intent	Possible admission; crisis intervention
Low	Modifiable risk factors; strong protective factors	Thoughts of death, no plan/intent	Outpt referral; give emergency/crisis number

<https://www.samhsa.gov>

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Self-Injurious Behavior (SIB)

- Intentional self-inflicted damage
- Not usually suicidal intent
- Relief
- Interpersonal difficulty
- Positive feelings
- Boredom

Self-injurious Behavior Most Common Methods

- Skin cutting (70-90%)
- Head banging or hitting (21%-44%)
- Burning (15%-35%)

How Common is SIB?

- 15% of teens report some form of self-injury
- ~50% of adolescents on inpatient psych unit
- College students 17%-35%



Treating SIB

- Ensure not SI
- Treat underlying psychiatric comorbidity (mood disorder, trauma)
- Limits with medications (SSRI→Atypical antipsychotics→Lithium)
- Avoid Benzos
- DBT (Dialectical Behavior Therapy)

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ASD

- Aggressive SIB: head-banging, hand-biting, and excessive self-rubbing and scratching
- Aggression towards others
- WHY:
 - Change in routine
 - Medical ailment
 - Puberty

Medical Comorbidity

- Constipation (meds or poor nutrition- Pica)
- Seizures (25-33% risk)
- Ear infections
- Dental infection
- Sleep problems, sleep apnea
- Undetected injuries
- UTI
- HA, other source of pain
- GERD

ASD

After ruling out medical etiology:

- Comorbidities
- Medication Adjustment
- Therapies (Applied Behavioral Analysis ABA)
- Inpatient Psych- very low yield
- Residential Treatment Center (RTC)

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Causes of Aggression and Agitation in the ED

- Disruptive Behavior Disorders
- Anxiety-provoked Aggression
- ID/ASD
- Organic Delirium
- Schizophrenia
- Mania
- Abuse/Neglect
- Substance use

Helpful Reminders When Dealing with Difficult Kids

- Victims of abuse 4x more likely to develop personality disorders
- Underlying psychiatric disorder
- ED can be threatening/anxiety-provoking
- Approach with compassion → Adherence



Guidelines for Treatment of Agitation

- Clearly introduce yourself; assure pt you are there to keep him/her safe; this is your job
- Use simple language, soft voice, slow movements
- Keep your distance
- Relaxed Body Language
- Maintain privacy and respect, nonjudgmental attitude, active listening, remain engaged
- Address hunger, thirst, comfort, warmth and pain
- Give choices when available (choice of drink)

Guidelines for Treatment of Agitation

- Offer distracting toys, sensory modalities
- Explain what comes next
- Discuss restraint and offer reward for calm behavior
- Reduce environmental stimuli (dim lights, reduce noise, redirect traffic)
- Remove access to breakable objects
- Prepare with staff for the next step if calming strategies fail
 - do med calculations
- Engage consultants: SW, Psych, security
- Consider need for physical restraints
- Prepare algorithm for pharmacological management

Meds for Agitation

- Should only be used when safety a concern
- To calm, not to cause sedation/sleep
- Not for punishment
- Involve patients
- Consent/Assent
- Oral preferred to IM or IV
- Check your own anger/frustration before restraining

Medications Used for Pediatric Agitation

1. Antihistamines
2. Benzodiazepines
3. Typical Antipsychotics
4. Atypical Antipsychotics

Antihistamines

- Diphenhydramine or Hydroxyzine
- Familiar
- Paradoxical reactions
- Not without side effects
- Especially useful if underlying anxiety

Benzodiazepines

- Lorazepam, Midazolam, Diazepam
- Lorazepam 0.05-0.1mg/kg/dose (usually 1-2mg) PO/IM/IV
- Main side effects: sedation and respiratory depression
- Paradoxical reactions (disinhibition): DD, impulse control problems, ASD, ID, LD

Antipsychotics

- Atypical > typical
 1. Risperidone
 2. Olanzapine
 3. Ziprasidone
- Side effects:
 - Fatigue
 - HA,
 - CV changes
 - increased appetite
 - metabolic syndrome
 - weight gain
 - hyperglycemia
 - dyslipidemia
 - NMS

Recommended Dosages of Antipsychotics for Treatment of Pediatric Acute Agitation (6-18years)

Medication	Oral	Intramuscular	Intravenous
Haloperidol	0.01-0.03mg/kg/day once daily	1-3mg/dose up to four times daily	0.5-5mg/dose in up to four times per day*
Risperidone	0.25-0.5mg mg/day oral liquid or ODT	NA	NA
Olanzapine	2.5-5mg/day oral tablet or ODT	5mg/dose in children 10mg/dose in adolescents	NA
Ziprasidone	Not recommended	5mg/dose in children 10mg/dose in adolescents	NA

Caution!

- IM Olanzapine + Lorazepam → Respiratory depression and hypotension



Finding options

- NAMI
 - <http://www.nami.org>
- Website for psychiatric and substance abuse resources
 - <http://findtreatment.samhsa.gov/>
- Referral agency for residential treatment
 - <http://www.kidlinknetwork.com/>

THANK YOU!

References

- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders: DSM-5*. Washington, D.C: American Psychiatric Publishing. ISBN 978-0890425558.
- Bardach, N., Coker, T., Zima, B., et al. Common and Costly Hospitalizations for Pediatric Mental Health Disorders. *Pediatrics*. 2014 Apr; 133(4): 602–609. doi: 10.1542/peds.2013-3165.
- Boyer, E and M Shannon. The Serotonin Syndrome. *NEJM*. 352:11. March 2005. 11112-1120.
- Buckley PF, Hutchinson M (1995). Neuroleptic Malignant Syndrome. *Journal of Neurology, Neurosurgery, and Psychiatry*. 58 (3): 271–3. doi: 10.1136/jnnp.58.3.271
- Centers for Disease Control and Prevention (CDC). Web-based Injury Statistics Query and Reporting System (WISQARS) [Online]. (2013) National Center for Injury Prevention and Control, CDC (producer). Available from URL www.cdc.gov/injury/wisqars/index.html
- <https://www.cdc.gov/nchs/products/databriefs/db241.htm>
- Dulcan, Mina. *Dulcan's Textbook of Child and Adolescent Psychiatry*. 2010.
- Shaw, Richard. *Textbook of Pediatric Psychosomatic Medicine*. 2010.
- Fink M and M Taylor. Review of Catatonia. *Archives of Psychiatry JAMA*. November 2009.
- Guertin T, Lloyd-Richardson E, Spirito A, et al. Self-mutilative behavior in adolescents who attempt suicide by overdose. *J Am Acad Child Adolesc Psychiatry*. 2001;40:1062–9.
- Kerr, P. L., Muehlenkamp, J. J., & Turner, J. M. (2010). Nonsuicidal self-injury: A review of current research for family medicine and primary care physicians. *Journal of the American Board of Family Medicine* 23(2), 240-259.

References

- Kinsell, L. Libby Zion's Lesson: Adverse Drug Reactions and Interactions. 2009. *American Academy of Neurology*. www.patients.aan.com
- Lahutte B. Multidisciplinary approach of organic catatonia in children and adolescents may improve treatment decision making. *Progress in Neuro-Psychopharmacology and Biological Psychiatry*. 32 (2008) 1393-1398.
- Marzullo, L. Pharmacologic Management of the agitated child. *Pediatric Emergency Care*. 2014 30:4 p 267-275.
- Neuhut, R. Neuroleptic malignant syndrome in children and adolescents on atypical antipsychotic medication: a review. *Journal of Child and Adolescent Psychopharmacology*. 19:4. 2009. p415-422.
- McGonigle, J. et al. Management of Agitation in individuals with Autism Spectrum Disorder in the Emergency Department. *Child Adolesc Psychiatric Clin N Am* 23 (2014) 83–95 <http://dx.doi.org/10.1016/j.chc.2013.08.003>
- Schatzberg, Alan. *Textbook of Psychopharmacology*. 2004.
- Selby, E. A., Kranzler, A., Fehling, K. B., & Panza, E. (2015). Nonsuicidal self-injury disorder: The path to diagnostic validity and final obstacles. *Clinical Psychology Review*, 3879-91. doi:10.1016/j.cpr.2015.03.00

References

- Sienaert, P., Dhossche, D., Vancampfort, D., De Hert, M., Gazdag, G. (2014). A Clinical Review of the Treatment of Catatonia. *Front Psychiatry* 2014; 5:181. doi: 10.3389/fpsy.2014.00181
- Smith, B. Self-Mutilation and Pharmacotherapy. *Psychiatry (Edgmont)*. 2005 Oct; 2(10): 28-37.
- Sonnier, L., Barzman, D. Pharmacologic management of acutely agitated pediatric patients. *Pediatric Drugs* 2011, 13(1).
- Wing L, Shah A. Catatonia in autistic spectrum disorders. *Br J Psychiatry* (2000) 176:357–6210.1192/bjp.176.4.357