

Behavioral Management of Children With Autism in the Emergency Department

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Abstract: Autism spectrum disorder (ASD) is characterized by impaired social communication in conjunction with patterned behaviors. Often associated with emotional dysregulation, irritability, aggression, depression, and suicidality, ASD youth frequently present to the emergency department for behavioral and mental health evaluation. Psychiatric comorbidities, agitation, and depression are commonly encountered. During these visits, practitioners must thoughtfully consider organic etiologies for presenting symptoms, formulate plans to address risk of agitation, and understand how to effectively formulate disposition options in this patient population.

Key Words: autism spectrum disorder, agitation, depression, mental health, suicidality

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TARGET AUDIENCE

This review is intended for healthcare providers who care for patients with autism spectrum disorder (ASD) in the ED, acute care, hospital, and outpatient settings.

LEARNING OBJECTIVES

After completion of this article, the reader should be able to:

1. Identify factors which may suggest an organic etiology of symptoms in agitated ASD youth
2. Describe indications for inpatient psychiatric admissions for ASD youth presenting with depression and externalizing behaviors
3. Explain indications and pharmacologic options for managing agitation in ASD youth in acute care settings

BACKGROUND

Autism spectrum disorder is a developmental disorder defined by impairment of social communication in combination with restrictive, repetitive and stereotyped behaviors.¹ Children with ASD are 4 times more likely than neurotypical peers to present to the emergency department (ED), and the number of ED visits in ASD youth has increased over the past 2 decades.² Up to 20% of ED visits in adolescent ASD patients are related to emotional and behavioral health concerns.² It is estimated that nearly 70% of patients with ASD carry at least one comorbid psychiatric diagnosis and 40% carry 2 or more.^{3–5} Approximately two thirds of ASD patients are prescribed psychotropic medications, highlight-

ing the challenges of effective behavioral management at baseline and the complexities of emergency stabilization.^{4,6}

Behavioral concerns, mood symptoms, agitation, and self-injurious behaviors are common reasons for ED referral.² Successfully navigating behavioral health ED visits in ASD youth requires knowledge of common psychiatric comorbidities, staying attuned to potential organic etiologies of agitation, working closely with caregivers to identify goals of care and disposition, and understanding interventions to safely address behavioral escalations.

PSYCHIATRIC COMORBIDITIES

Psychiatric comorbidities are more common in youth with ASD than in neurotypical peers or other children with developmental disability.^{3,7} A lack of standardized assessments, the presence of communication barriers, and a wide range of intellectual capabilities within the population makes evaluation challenging.^{7,8} Identification of underlying psychiatric comorbidities can allow providers to better care for ASD patients in the acute care setting. Attention-deficit/hyperactivity disorder, depression, anxiety, oppositional defiant disorder, and obsessive-compulsive disorder are common.^{3,4,6,8,9} Comorbid diagnoses of schizophrenia or bipolar disorder are much less frequent.^{5,8}

APPROACH TO THE BEHAVIORAL ED VISIT

Routine Behavioral Management in the Emergency Department

As discussed in our previous work on the ED medical management of patients with ASD, EDs can use strategies to minimize stress during an emergent care visit. Emergency departments should attempt to minimize wait times and provide families with quiet, low stimulus spaces in which to receive care.¹⁰ Families should be encouraged to provide information on their children's preferred accommodations, potential stressors, and preferred communication style.¹¹

Providers should create a calm atmosphere within the care space while offering preferred somatosensory items, which can decrease anxiety and likelihood for agitation.¹¹ Augmentative and Alternative Communication systems and visual schedules can guide patients during the ED visit and enhance comfort and familiarity with the care plan.¹² Parents should be considered experts in their child's care, and ED staff should respond to their guidance on what communication styles and accommodations work best. Child life specialists should be used when available.¹³

Medical Workup Considerations

In ASD patients with behavioral concerns, clinicians should conduct a thorough evaluation for organic etiologies. Symptoms must be considered in the context of both the patient's medical and social history.¹ In agitated ASD youth, attention to changes in behavioral patterns may be particularly helpful in identifying potential organic causes,¹ and caregiver history plays a critical role.¹ A broad differential should be considered, including ingestion,

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Dr. Uspal discloses that the U.S. Food and Drug Administration has not approved the use of olanzapine for the treatment of agitation in children, as discussed in this article. Please consult the product's labeling for approved information.

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intoxication, causes of pain, medication side effects, sequelae of vitamin and nutritional deficiencies from a selective diet (eg, bone pain from scurvy), infection, and traumatic brain injury.^{1,14–16} Constipation, gastrointestinal complaints, seizures, and metabolic abnormalities are frequently associated with ASD and should also be considered. An organic cause is more likely in patients presenting at a very young age, with symptoms without clear psychosocial associations, and in patients with delirium, abnormal vital signs, or abnormal physical findings.^{1,14}

COMMON BEHAVIORAL HEALTH CONCERNS

Suicidality

Patients with ASD are often subject to significant stressors. Communication and behavioral challenges can result in bullying and social isolation. Patients with ASD are highly routine dependent and often struggle greatly with disruptions in routine caused by social stressors. These and other factors can lead to the development of significant behavioral reactivity, including suicidality.¹⁷

Children with ASD in one study were twice as likely to have suicidal thoughts as children with other neurodevelopmental issues¹⁸ and, in a second study, were 28 times more likely to have a history of suicidal ideation or attempt versus neurotypical children.¹⁹ Children with ASD present to EDs for suicidality nearly as frequently because they present for externalizing behavioral disturbances.²⁰ Children with ASD and mood disorders are 7 times as likely to require inpatient psychiatric hospitalization versus children with ASD alone.²¹ Adults with ASD are more likely to die by suicide than neurotypical peers; this effect is greatest in individuals without intellectual disability.^{22,23}

However, identification of suicidality in children with ASD is challenging. Suicide screening tools, such as the Ask Suicide Screening Questions toolkit, are not validated in this population. Using adult suicide screening tools may underestimate suicidality in adults with ASD.²⁴ At present, a combination of screening tools and direct clinical evaluation is considered the most effective way to identify risk for suicide in children with ASD.

Once suicidality is identified, assessment should evaluate risk with consideration of the specific needs of patients with ASD. Particular attention should be paid to acute stressors, including increased bullying or loss of supportive relationships. Impulsivity and externalizing behaviors are associated with increased risk of suicide attempt.¹⁹ Clinicians should evaluate for risk factors, such as statements of intent, access to dangerous means, recent attempt or plans, and profound impulsivity or dysphoria.²⁵ The presence of social supports is protective against suicide.²⁵

If a patient is felt appropriate for discharge, safety planning should include clear directives to address sources of distress and environmental risks, using reasoning patterns that match patient communication styles. Coping strategies should be tailored to the interests of the child, such as engagement in circumscribed activities, as more social demands may be anxiety provoking.²⁶ Caregivers should also receive lethal means restriction counseling, a critical aspect of postdischarge safety.

Externalizing Behaviors/Aggression

In children presenting with externalizing behaviors, the first objective is to try to identify the cause of the patient's reactivity. If behaviors are new or different, do they have any historical antecedents, and what were their causes? A medical cause of behavioral change should be assumed until proved otherwise.¹ In many cases, the identification and addressing of a source of pain or discomfort improve patients' behaviors, even in patients admitted to inpatient psychiatric units.²⁷

If no medical cause of symptoms is identified, environmental and social stressors at home or school should be explored. Changes in routine, family stressors, and patient maltreatment are issues that can lead to externalizing behaviors in patients with ASD.²⁸ Psychiatric comorbidities including attention-deficit/hyperactivity disorder, anxiety, and mood disorders can exacerbate behavioral issues. Communication impairments can escalate frustration, contributing to risk of externalizing behaviors. Sleep disturbances and maladaptive reinforcement patterns can also be causative.²⁹

The decision to admit a patient for behavior should balance immediate safety concerns with likelihood of benefit, potential harms from disruption of routine and schooling, separation from family and support systems, and cost. Careful consideration should be made as to whether the patient's behaviors have exceeded the family's coping mechanisms.³⁰ Predictors for need of inpatient admission in ASD patients include low adaptive functioning, ASD symptom severity, primary caregiver's marital status, mood disorders, and sleep problems.²¹ While there may be benefit in hospitalization for acute stabilization, longstanding behavioral issues are better treated in longitudinal programs that allow for consistent approaches to nurture more adaptive coping styles.

Alternatives to inpatient psychiatric admission should be considered, because optimizing naturalistic environments is preferred. Respite care use is associated with a short-term decrease in admission risk,³¹ although this service is often difficult to access.³² The type of psychiatric program a patient may be admitted to is also an important consideration. Strategies used in general pediatric psychiatric units, such as nuanced verbal interventions and high levels of social interaction, may be counterproductive in children with ASD. Patients may receive greater benefit from specialized ASD units,³³ although general psychiatric units may effectively treat children with ASD with appropriate accommodation.³⁴

For patients appropriate for discharge, continuity with outpatient providers is critical. Crisis planning should be completed, with attention to potential triggers for distress and feasible mitigation strategies. Autism Speaks hosts multiple online resources designed to improve maladaptive behaviors and alleviate caregiver strain.^{35,36} Outpatient crisis services to rapidly follow-up with families should be used where available.³⁷ Medication management is generally performed in the outpatient setting, but families and outpatient providers can be directed to psychiatric support resources, including specialty consultation.^{38,39} Clear return to care guidelines should be offered to families so they feel comfortable seeking further care if symptoms escalate.

AGITATION MANAGEMENT IN THE ED

Up to 20% of the ASD population has moderate to severe irritability and aggression.⁴⁰ Agitation and aggression can be unpredictable and dangerous, creating stress for families and medical teams. Interventions are often needed for de-escalation in the acute care setting (Fig. 1). Consulting with caregivers often gives insight into which techniques and therapeutic options may offer the most benefit. If agitation escalates, specialized care teams trained in de-escalation and patient safety should be used to support frontline clinicians.⁴¹

Nonpharmacologic Interventions

When assessing agitation, providers should first evaluate exacerbating factors specific to the ED visit. Creating a calming environment and providing somatosensory items may help reduce concerning behaviors.

If behaviors continue to escalate, clinicians can attempt to verbally redirect patients. Directives should be simple and clear, avoiding metaphors and abstract analogies. Patients should be

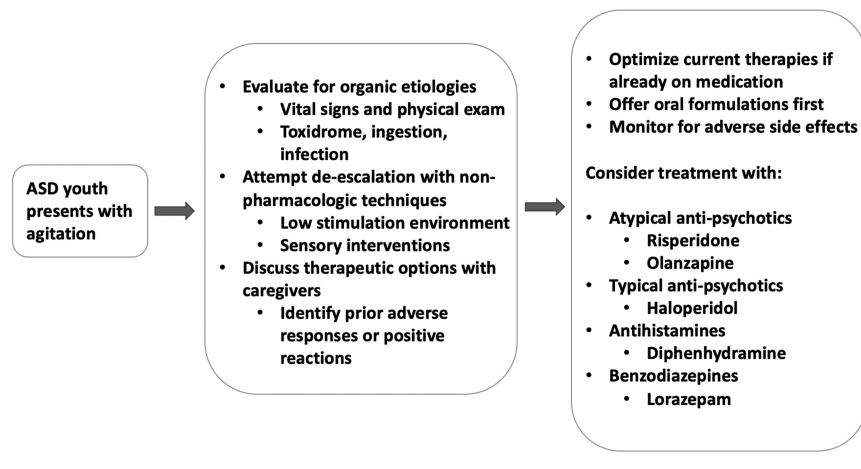


FIGURE 1. Approach to youth with ASD presenting with agitation.

given time to process directives, and directives should be repeated (or clearly displayed for those with language impairment) to increase understanding. Clinicians can offer toys and food to induce patient compliance.

Patients exhibiting behaviors posing an imminent risk to themselves or others may require physical or mechanical restraint. Alternatives to restraint should be considered before its use with the goal of supporting the preferences of the child and family. The patient's room can be made safe by removing bed frames, workstations, and other sources of potential harm. Blocking the room door may reduce risk while allowing some freedom of movement and utilization of distracting activities. Staff should be present just outside the room to avoid a sense of isolation and to coach de-escalation.

Physical restraint should be considered a last resort. Its use is associated with significant physical and mental harms,⁴² with numerous reports of restraint associated deaths in children in disparate care settings.⁴² Patterns of restrain use have also revealed inequities suggestive of racial and ethnic bias in implementation.⁴³

If restraint is required, vests, safety boards and other specialized equipment designed to reduce injury should be used by a trained safety team. The period of restraint should not exceed the length required to de-escalate the situation to a safe state.¹ Clinicians must adhere to federal and local guidelines regarding patient assessment, reassessment, and documentation (Table 1).⁴⁴

Pharmacologic Interventions

Agitated youth with ASD may require pharmacologic intervention in situations where patient, staff, or caregiver safety is at risk or there is significant property damage risk.¹⁴ Administration of medications should prompt providers to reconsider potential medical contributors to agitation.

There is a paucity of evidence supporting the use of specific medications for treatment of agitation in pediatric patients. Recommendations are based on clinical expertise, expert consensus, and adult data (Table 2).⁴² Patient age, history, and the perceived cause of agitation should be considered in medication selection.

TABLE 1. Selected Center for Medicaid and Medicare Services Requirements for the Use of Restraints

- Restraint may only be imposed to ensure immediate physical safety
 - Restraint may only be used when less restrictive interventions are ineffective.
 - The use of restraint or seclusion must be in accordance with the order of a physician or other licensed independent practitioner who is responsible for the care of the patient
 - Unless superseded by State law that is more restrictive each order for restraint may only be renewed in accordance with the following limits for up to a total of 24 h:
 - 4 h for adults 18 y or older
 - 2 h for children and adolescents aged 9–17 y or
 - 1 h for children younger than 9 y and
 - Restraint or seclusion must be discontinued at the earliest possible time
 - The condition of the patient who is restrained must be monitored
 - The patient must be seen face-to-face within 1 h after the initiation of the intervention to evaluate
 - The patient's immediate situation
 - The patient's reaction to the intervention
 - The patient's medical and behavioral condition
 - The need to continue or terminate the restraint or seclusion
 - When restraint or seclusion is used, there must be documentation in the patient's medical record of the following:
 - The 1-h face-to-face medical and behavioral evaluation
 - A description of the patient's behavior and the intervention used
 - Alternatives or other less restrictive interventions attempted (as applicable)
 - The patient's condition or symptom(s) that warranted the use of the restraint or seclusion
 - The patient's response to the intervention(s) used, including the rationale for continued use of the intervention

TABLE 2. Pharmacologic Management for Acute Agitation

Medication	Dose	Route	t_{\max}	$t_{1/2}$	Clinical Pearls and Application
Diphenhydramine (Benadryl)	• 1 mg/kg/dose q4–6 h • Max dose = 50 mg	PO IM IV	2 h	5–9 h	<ul style="list-style-type: none"> • Can consider for: anxiety • May give if muscle stiffness or movement problems develop after use of an antipsychotic • Risk for EPS, seizure • May cause disinhibition, especially with very young children and those with developmental delay • Risk for euphoric rush if pushed too fast via IV route
Hydroxyzine (Atarax)	• 0.5 mg/kg/dose q6–8 h • Max dose = 50 mg	PO	2 h	7–29 h	<ul style="list-style-type: none"> • Can consider for: anxiety • Risk for EPS, seizure • May cause disinhibition, especially with very young children and those with developmental delay
Lorazepam (Ativan)	• 0.05 mg/kg/dose q30 min • Max dose = 2 mg	PO IM IV	2 h 1–3 h	12 h 12 h 14 h	<ul style="list-style-type: none"> • Can consider for: anxiety; EtOH withdrawal • Risk for respiratory depression, sedation • May cause disinhibition, especially with very young children and those with developmental delay
Risperidone (Risperdal)	5–17 y/o AND < 20 kg • 0.25 mg/dose q2 h • Max daily dose = 1 mg 5–17 y/o AND ≥ 20 kg • 0.5 mg/dose q2 h • Max daily dose = 2 mg ≥ 18 y/o • 2 mg/dose q2 h • Max daily dose = 6 mg	PO (ODT)	Extensive metabolizers: 3 h; poor metabolizers: 17 h	Extensive metabolizers: 21 h; poor metabolizers: 30 h	<ul style="list-style-type: none"> • Can consider for: psychosis or mania; impulsive, maladaptive aggression • Risk for EPS, QTc prolongation (less than haloperidol)
Haloperidol (Haldol)	3–12 y/o • 0.025 mg/kg/dose q30 min • Max daily dose = 2 mg ≥ 13 y/o • 0.05 mg/kg/dose q30 min • Max daily dose = 5 mg	IM	0.33 h	21 h	<ul style="list-style-type: none"> • Can consider for: psychosis or mania • Risk for QTc prolongation, EPS (and NMS), seizure • IV administration is associated with high cardiac risk • IM injection very rapidly absorbed
Olanzapine (Zyprexa)	3–12 y/o • 2.5 mg/dose q30 min • Max daily dose = 10 mg 13–17 y/o • 5 mg/dose q30 min • Max daily dose = 20 mg ≥ 18 y/o • 10 mg/dose q30 min • Max daily dose = 30 mg • 2–4 mg/kg/dose • Max dose = 200 mg	PO (ODT) IM IM	6–8 h children (10–18 y/o) 4.7 ± 3.7 h; adults ~6 h 0.25–0.75 h 5–30 min	7 h children (10–18 y/o) 37.2 ± 5.1 h; adults ~30 h 3–4 h	<ul style="list-style-type: none"> • Can consider for: psychosis or mania; impulsive, maladaptive aggression • Risk for cardiorespiratory depression—bradycardia, hypotension, EPS, QTc prolongation (less than haloperidol) • ODT well absorbed (not affected by food); IM injection rapidly absorbed • Avoid coadministering IM formulation with benzodiazepines within 60 min of administration—risk of respiratory depression

Adapted from Hilt and Woodward (2008).⁴⁵ Additional data from Lexicomp.⁴⁶

IM indicates intramuscular; IV, intravenously; ODT, orally disintegrating tablet; PO, per mouth.

Caregivers should be involved in decision making, because they may provide guidance based on prior experience and commonly maintain decision-making capacity for their child in the context of emergent care.

Medications may be administered to improve behaviors and allow increased interaction with staff and the environment. Chemical restraint, on the other hand, is defined as a pharmacologic intervention that is nonroutine and specifically administered to

restrict a patient's movement or interaction with their environment.^{14,44} It is only indicated to prevent harm to self or others and should only be considered if all other de-escalation options have been pursued. Chemical restraint should not be used as a form of discipline or as a convenient solution to staffing limitations.¹⁴

Oral formulations of medications should be offered as a first option for agitation management.^{14,15} They are considered as effective as injectable preparations and may give patients a sense of control, while avoiding exposure to the trauma of a compelled intramuscular injection.¹⁴ When the underlying cause of agitation is consistent with a known psychiatric disorder, treatment should use medication that is that disorder's standard of care. For any medication, low doses should be used with titration to effect, preferably using agents with known benefit for the patient or carrying the lowest risk of adverse effects.¹

Antipsychotics

Atypical antipsychotics are the medications most frequently used to treat acute agitation in youth with ASD.^{14,47} There is strong evidence for scheduled use of these medications in reducing aggression and irritability in this population. Risperidone and aripiprazole are the only medications currently approved by the Food and Drug Administration for the treatment of agitation in patients with ASD.⁴⁰ However, aripiprazole is not recommended for acute agitation secondary to concerns for akathisia.¹⁴ Subsequently, olanzapine and risperidone are the most commonly used in clinical settings for management of agitation in ASD youth.^{1,14} Olanzapine is more sedating than risperidone¹⁵ and is available in an intramuscular formulation,¹ although use of intramuscular olanzapine and benzodiazepines within 60 minutes of each other should be avoided secondary to potential respiratory depression.

Haloperidol is a typical antipsychotic frequently used to treat agitation in emergent settings^{14,48} with demonstrated efficacy in the ASD population.⁴⁸ Atypical antipsychotics are generally preferred over typical antipsychotics, however, secondary to a stronger safety profile and greater efficacy in pediatric patients.^{48,49}

Adverse reactions of antipsychotics include extrapyramidal symptoms (EPS), dystonia, and akathisia.¹⁴ Children and adolescents are at particular risk of EPS.¹⁴ Patients treated with antipsychotics should be monitored for neuroleptic malignant syndrome (NMS), characterized by hyperthermia, altered mental status, autonomic instability, rigidity, and elevated creatine kinase.¹⁴ Typical antipsychotics like haloperidol are more likely to cause NMS and dyskinesias and should be used cautiously in ASD youth.¹⁴

Antihistamines

Antihistamines, such as diphenhydramine and hydroxyzine, although frequently used for behavioral management, have not been formally approved for treatment of anxiety, agitation, or insomnia in pediatric patients and limited evidence supports their use in ASD youth.¹⁴ Paradoxical reactions to diphenhydramine are more common than in neurotypical children, and caregivers should be consulted about past experiences before administration.^{14,15} In addition to unintended agitation, adverse reactions include anticholinergic effects, dizziness, and tachycardia.^{14,45}

Benzodiazepines

Benzodiazepines should also be used cautiously in the ASD population because of potential disinhibitory effects and paradoxical reactions.^{14,15,47} They may be particularly beneficial in patients with acute anxiety or toxic ingestion. If given, lorazepam is often preferable because of rapid absorption and quick onset. In rare cases of youth with ASD and catatonia, this medication also plays a central role in both testing and treatment.⁵⁰ The ad-

verse effect profile of benzodiazepines is advantageous, because movement disorders are not present and a reversal agent is available.¹⁴ Children receiving benzodiazepines should be monitored for sedation and respiratory depression.

CONCLUSIONS

Children with ASD frequently present to EDs with psychiatric and behavioral acuity. Care must be taken to identify potential organic etiologies contributing to dysregulation. Hospitals and clinicians should provide a calm care environment and use appropriate communication strategies and caregiver perspectives to facilitate engagement. Acute treatment for externalizing behaviors should be as least restrictive as possible. Disposition decisions should balance patient and family safety with recognition of the limitations of hospitalization and the priority of optimizing naturalistic settings to foster behavioral stabilization.

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