Challenges of Managing Pediatric Mental Health Crises in the Emergency Department

Thomas H. Chun, MD, MPH[a,b,*], Emily R. Katz, MD[c], Susan J. Duffy, MD, MPH[a,b], Ruth S. Gerson, MD[d]

KEYWORDS

• Psychiatric emergency • Pediatric • Autism • Developmental disorders

KEY POINTS

- Children and adolescents presenting to emergency departments with psychiatric crises are burgeoning; optimal care of these patients includes close collaboration between emergency medicine and psychiatry physicians.
- The evaluation and management of aggressive and/or violent patients, requires a range of skills and knowledge, including verbal de-escalation as well as knowledge of safe chemical and physical restraint practices.
- Children with autism spectrum or other developmental disorders in the emergency department also require specialized skills for communication, transition planning, and calming and soothing the patient.

Conflict of Interest: The authors have no conflicts of interest to disclose.
Grant Support: Supported in part by "Teen Alcohol Screening in the Pediatric Emergency Care Applied Research Network", U03 MC22685, National Institute for Alcohol Abuse and Alcoholism, R01 AA021900 (T.H. Chun).
This article has been revised and updated from an article originally published in *Pediatric Clinics of North America* by Chun, Katz, and Duffy in 2013, entitled "Pediatric Mental Health Emergencies and Special Health Care Needs."
[a] Department of Emergency Medicine, Alpert Medical School of Brown University, 222 Richmond Street, Providence, RI 02903, USA; [b] Department of Pediatrics, Alpert Medical School of Brown University, 222 Richmond Street, Providence, RI 02903, USA; [c] Department of Psychiatry and Human Behavior, Alpert Medical School of Brown University, 222 Richmond Street, Providence, RI 02903, USA; [d] Bellevue Hospital Children's Comprehensive Psychiatric Emergency Program, Department of Child and Adolescent Psychiatry, NYU School of Medicine, 462 1st Avenue, New York, NY 10016, USA
* Corresponding author. Department of Emergency Medicine, Rhode Island Hospital, Claverick 243, 593 Eddy Street, Providence, RI 02903.
E-mail address: Thomas_Chun@brown.edu

Child Adolesc Psychiatric Clin N Am 24 (2015) 21–40
http://dx.doi.org/10.1016/j.chc.2014.09.003 **childpsych.theclinics.com**
1056-4993/15/$ – see front matter

COMMENTARY: CRISIS IN THE EMERGENCY ROOM: MANAGING PEDIATRIC MENTAL HEALTH CRISES IN THE EMERGENCY DEPARTMENT

The constriction of inpatient and outpatient services for children's mental health treatment, coupled with an increased awareness of the potentially disastrous consequences of untreated suicidality and aggression in children and adolescents, has led to a dramatic increase in youth presenting to the Emergency Room (ER) for psychiatric care. This article, updated from an article published in the *Pediatrics Clinics of North America* in 2013, highlights the key features of appropriate emergency evaluation and treatment of youth in psychiatric crisis. The article's description of detailed and structured risk assessment, involvement of family and other key caregivers, careful use of de-escalation strategies to ensure safety in the ER, and connection to appropriate inpatient or outpatient services provides a much-needed standard for high-quality emergency psychiatric care for children.

Unfortunately, too many children and adolescents in psychiatric crisis do not receive such care. Emergency programs, due to lack of funding, support, and training, have not kept pace with the escalating demand for emergency psychiatric care. Most children and adolescents in psychiatric crisis are seen in general pediatric or medical ERs, which are crowded, noisy, high-stimulation environments, often with long wait times and little available private or quiet space.[1,2] For agitated, paranoid, traumatized, or autistic youth, this can be disastrous, often ending in restraints or seclusions that might have been avoided in a quieter, calmer setting. Adding to the difficulty of managing these patients in ERs, most young people presenting with a psychiatric crisis are treated by pediatric emergency clinicians and staff who lack psychiatric training, or by adult psychiatric clinicians who lack training in the diagnosis and treatment of children and adolescents. In a statewide survey in California, only 10% of emergency programs had child psychiatrists available for consultation (and most who did were academic centers, not community hospitals); less than 35% had general psychiatrists available, only 15% had a psychiatric nurse present, and less than 50% programs had a social worker (and not necessarily a psychiatric social worker) to assist in evaluation or disposition.[3] Medical providers see most young people presenting to ERs in psychiatric crisis, but only a third of these providers have ever had any training in treating psychiatric patients.[4] More than half of the youth presenting to the ER after a suicide attempt or other episode of deliberate self-harm never receive any mental health evaluation.[5] Of youth presenting with mental health complaints (including self-harm and suicide attempts) to the ER, two-thirds are discharged, but only about a third of patients are given a referral for any psychiatric follow-up care.[1,5] Clinicians may lack sufficient training to recognize the need for a hospitalization or outpatient referral; there may not be inpatient beds or outpatient services available; or insurance may balk at paying for psychiatric treatment (particularly inpatient or intensive treatment). When an outpatient referral is made, there are often long wait lists to be seen in community clinics, and in most communities, acute care outpatient services such intensive outpatient programs, partial hospitalization programs, and home-based crisis services are either unavailable or prohibitively expensive.

To ensure that every child and adolescent presenting to an ER in psychiatric crisis receives the standard of care described below would require a broad investment and collaboration between child and adolescent psychiatrists and pediatricians. Together, the following must be advocated for:

1. Development of clear standards of care for emergency evaluation and treatment
2. Increased training for emergency medical providers and pediatricians in identification and treatment of child mental illness, as well as in de-escalation and crisis management

3. Greater collaboration between emergency providers and child psychiatrists for consultation around high-risk cases
4. Greater availability and accessibility of high-quality inpatient and acute care outpatient services for youth in crisis
5. Coordination of research and program-development efforts to identify and disseminate efficacious and cost-effective models of crisis care, both ER-based and community-based, for children and adolescents.

Development of clear standards of care for emergency evaluation and treatment. The lack of consensus guidelines or standards of care for management of pediatric psychiatric emergencies means there is no metric by which hospitals can measure their performance. Child psychiatrists and pediatricians should collaborate to develop standards for evaluation, risk assessment, and management of agitation (including both nonpharmacologic and pharmacologic interventions), as well as for the staffing and physical space requirements for appropriate management of children in psychiatric crisis.

Increased training for emergency medical providers and pediatricians in identification and treatment of child mental illness as well as in de-escalation and crisis management. A few training programs for pediatricians, nurse practitioners, emergency medicine physicians, and other disciplines now offer opportunities for exposure to acute-care child psychiatry; these should be standardized and expanded. ER staff should undergo in-service training on identification and management of suicidality, perhaps including the use of suicide screening tools (either interview-based or computer-based) that have been shown to be effective in ER settings.[2] Staff training in verbal de-escalation and crisis management techniques will also help avoid unnecessary restraints of child psychiatric patients in the ER.

Greater collaboration between emergency providers and child psychiatrists for consultation around high-risk cases. With the national workforce shortage of child psychiatrists, it is crucial to find ways to extend the reach of child psychiatry through consultation. Telepsychiatry programs and phone consultation programs similar to the Child and Adolescent Psychiatry for Primary Care (CAP-PC) program for pediatricians and primary care physicians should be developed for ERs, to allow pediatricians greater access to child psychiatry consultation. Another innovation, used in Massachusetts and some other states, is the use of mobile psychiatric evaluation teams that can move from one hospital ER to another to provide expert evaluation and treatment of kids when a child psychiatrist or other specialized provider is not available.

Greater availability and accessibility of high-quality inpatient and acute care outpatient services for youth in crisis. Several innovative programs have been developed across the country to enhance quick access to crisis services. These programs include enhanced emergency programs such as the Comprehensive Psychiatric Emergency Program model developed in New York State, in which an inpatient crisis stabilization unit and crisis outpatient services are embedded within the ER; crisis clinics within outpatient clinics or attached to psychiatric ERs; and mobile crisis programs and emergency screening units that allow youth to receive emergency evaluations in the community rather than in a medical ER.

Coordination of research and program-development efforts to identify and disseminate efficacious and cost-effective models of crisis care, both ER-based and community-based, for children and adolescents. The innovations described demonstrate potential solutions to the challenges of managing child psychiatric patients in the ER, but they must be rigorously studied (both regarding efficacy and cost-effectiveness), standardized, and disseminated. The Pediatric Emergency Care

Applied Research Network's mental health interest group has led several large-scale research studies to identify best practices for mental health treatment in pediatric ERs, but a broader research effort is needed to evaluate consultation and telepsychiatry programs as well as the care of children in psychiatric ERs and community-based crisis services.

The emergency department has become the de facto safety net for children in psychiatric crisis, but ERs must be equipped to catch them. With collaboration and advocacy, it can be ensured that all children in crisis receive the kind of excellent care described later, and that they leave the ER with the clinical and social supports and services that will put them on the path to recovery.

INTRODUCTION

Visits for mental health problems to both pediatric primary care settings and pediatric emergency departments have skyrocketed in recent decades and now account for up to 25% to 50% of primary care and 5% of pediatric emergency department visits.[6–11] Both pediatricians[12] and pediatric emergency physicians[13–15] identify lack of training in and lack of confidence in their ability to care for mental health problems as barriers to caring for these patients. Child and adolescent psychiatrists can play a significant role and be an important resource for pediatric clinicians who care for these patients. This article includes the 2 most common pediatric mental health emergencies, both of which involve threats to safety:

1. Suicide, where there is risk of harm to the patient, and
2. Homicide or aggression, where there is risk of harm to others.

In addition, the challenges of caring for children with autism or other developmental disabilities in medical settings are also discussed. The foci of this article are the key elements and practical suggestions for pediatric providers, when caring for these populations.

SUICIDAL IDEATION AND SUICIDE ATTEMPTS

Key Points

- Suicide is one of the leading causes of death in pediatric patients.
- Constant observation is necessary to ensure patient safety during suicide evaluation and crisis stabilization.
- Evaluation includes assessment for potential underlying or associated medical conditions.
- Laboratory and/or imaging should be obtained on an as-needed basis.
- High-risk patients should be referred directly for inpatient psychiatric admission.
- Less-intensive treatment options may be considered for patients who are able to maintain their safety in outpatient settings.
- Although no medications directly treat suicidality, there are safe and effective treatments for most of the associated psychiatric conditions.
- All evaluations of patients in the setting of suicidal ideation or suicide attempts should include a thorough discussion of safety planning, including means restriction and indications for seeking emergency care.

Introduction

Suicide is the third leading cause of death among persons aged 10 to 24, accounting for more than 4000 deaths per year.[16] Approximately 16% of teenagers report having seriously considered suicide in the past year; 12.8% report having planned a suicide

attempt, and 7.8% report having attempted suicide in the past year. Although only a small percentage of suicide attempts lead to medical attention,[17] suicide attempts still account for a significant number of emergency visits.[18]

Risk factors

Female teenagers are more likely to consider and attempt suicide, but male teenagers are more than 5 times more likely to complete suicide. This difference is primarily accounted for their use of more lethal means: male teenagers are more likely to attempt via firearms and hanging, whereas female teenagers are more likely to attempt via overdose.[17] Other risk factors for attempting and/or completing suicide include the following[19–27]:

- History of previous suicide attempts
- Impulsivity, mood, or behavior disorders
- Recent psychiatric hospitalizations
- Substance abuse
- Family history of suicide
- History of physical or sexual abuse
- Homelessness/runaways
- Identification as lesbian, gay, bisexual, or transsexual.

Evaluation

Identifying at-risk patients

Some patients will identify themselves as being suicidal with suicidal ideation or suicide attempt as their chief complaint. However, many may not proactively report their suicidality to providers.[28] Given the prevalence of suicidal ideation and attempts as well as the morbidity and mortality associated with attempts, pediatric providers are encouraged to screen all of their teen patients for suicidality.[29–31] Screens may be brief and focused directly on suicide risk[32] or more extensive/part of a broader mental health screening tool, such as the Pediatric Symptom Checklist. All patients presenting with mood symptoms, substance abuse, ingestions, acute intoxication, single-car motor vehicle crashes, self-inflicted or accidental gunshot wounds, and falls from significant heights should be screened for the presence of suicidal ideation.

Ensuring safety

First and foremost, providers must ensure the safety of the patient, their family, and health care staff during the course of the evaluation. Whenever concern for suicidal ideation or attempt is present, patients should be constantly monitored. They should not be left unobserved, as they are at risk for further injuring themselves or eloping. Patients should undergo a persons-and-belongings search. In some cases, it may be desirable to ask them to change into an examination gown, to decrease risk of harm and elopement. Patients should be placed in as safe a setting as possible, ideally one without access to medical equipment, which could be used for self-harm.

Confidentiality

When a physician is concerned that the patient may be at imminent risk for harm to self or others, confidentiality requirements no longer apply. Physicians may disclose information gathered by patients to caregivers and they may obtain information from others (including friends, family members, school personnel, and other caregivers) without obtaining consent from the patient or guardians.

Interview

Patients and caregivers should be interviewed both together and alone. It is essential that providers obtain collateral information from caregivers, because patients frequently minimize the severity of their symptoms or the intention behind their acts. It is paramount to ask patients directly about suicidality. Asking patients about suicidal ideation and attempts does not increase suicidal behaviors. In fact, it may have the opposite effect, as having an open, honest conversation about their suicidal thoughts may provide patients with a sense of safety and relief. This conversation may in turn enable them to fully disclose their suicidality and engage in treatment.

In addition to obtaining routine historical data, both medical and mental health histories, clinicians should obtain thorough details of the events and symptoms leading up to patient's presentation. Specific attention should be paid to the following:

- Recent psychosocial stressors, for example
  - Family conflict
  - Break-up of a romantic relationship
  - Bullying
  - Academic difficulties
  - Disciplinary actions/legal troubles
- Depression
- Mania
- Anxiety
- Psychosis
- Impulsivity
- Aggression
- Substance abuse
- Access to lethal means
  - Firearms
  - Knives
  - Medications
- Access to a responsible, supportive adult to whom they could turn if they had suicidal thoughts.

Younger patients tend to be triggered more often by family conflict, whereas older adolescents are more likely to cite peer or romantic conflicts.[33]

When discussing suicidal ideation, clinicians should inquire about a patient's reasons for considering/attempting suicide, and what—if any—their reasons are for living. Where were they, and what was happening immediately before the attempt? Was the attempt planned or impulsive? Did they do anything to avoid discovery? What was their expectation of the outcome? It should be noted that adolescents are typically poor judges of the dangerousness of their acts.[34,35] Although patients with low-lethality attempts may not be at significant medical risk, the *patient's* understanding of the potential lethality of their actions should be the basis of the suicide risk assessment.

Patients may deny that their behaviors constituted a suicide attempt and instead report that they "did it without thinking," or that they were just trying to go to sleep or get high or get a break from their feelings. Clinicians should be wary of accepting these explanations at face value and should probe for any signs of ambiguity or ambivalence. For example, in the setting of an overdose, it may be useful to ask if the patient questioned the safety of their ingestion beforehand. Was there any part of them that thought it might endanger their life? If so, it may be helpful to wonder out loud whether there was a part of them that would not have cared if they did not wake up from the

ingestion. If the patient acknowledges any ambivalence, the clinician should follow up by exploring what parts of them would not have cared, and how, in the face of awareness of the potential lethality of their planned ingestion, they arrived at the decision to carry it out.

If the patient responds by steadfastly denying any suicidal thoughts and/or maintaining that they did not consider the consequences of their actions, it may be that there truly was not intent for self-harm. However, there are some circumstances in which there is enough evidence supporting suicidal intent (such as statements to family and friends or postings on social media) that is concerning enough to overcome any potential reassurance from a patient's denial of intent for self-harm. There may also be circumstances in which a patient may not have had any intent to harm themselves, but their lack of judgment about the dangerousness of their actions could be considered life-threatening and still necessitate intensive psychiatric treatment.

Family interview

Parents should be questioned about recent signs, symptoms, and stressors as well as the details of the any events that may have led to the patient's presentation. In addition, pediatricians should inquire about the patient's access to lethal means, the level of the caregiver's knowledge of/concern for the patient's safety and well-being, their willingness/ability to monitor the patient, their level of openness to psychiatric treatment, and any barriers that might impede engagement in care. Clinicians should also work to identify areas of competence in both the patient and the family. These areas of strength form the basis for a successful treatment plan that enables the family to respond effectively to the crisis at hand.

Physical Examination

There are several purposes to the medical examination in suicidal patients. Clinicians should evaluate the patient for any evidence of injury or ingestion. Specific attention should be paid to the skin examination to look for evidence of cutting and also for signs suggestive of a toxidrome. Clinicians should examine the patient for any signs suggestive of an underlying medical cause for the patient's psychiatric symptoms or for any medical conditions that would require treatment beyond the initial medical evaluation.

Laboratory Testing

Many patients, particularly those with pre-existing psychiatric diagnoses and who have normal vital signs, a normal physical examination, and no "red flags" for medical illness on history and review of systems, do not require routine laboratory or radiologic testing.[36–38] Decisions to obtain laboratory testing should be based on the patient's presenting medical and mental health condition. Clinicians should have a low threshold, however, for obtaining toxicology screens and pregnancy screening. In addition, patients with an acute change in psychiatric symptoms, especially if psychosis or alterations in mental health status, typically require at least some laboratory evaluation.

Pharmacologic Considerations

There are no medications whose primary indication is the prevention or treatment of suicide. Pediatricians may consider starting a selective serotonin reuptake inhibitor (SSRI) for patients with a significant depressive episode or an anxiety disorder. If SSRIs are initiated, these patients and their caregivers should receive extensive education about and be closely monitored for worsening suicidal ideation.[39]

Pediatricians should be wary of prescribing disinhibiting medications such as benzodiazepines to suicidal patients and use extreme caution in prescribing medications that could be lethal in overdose (eg, tricyclic antidepressants or narcotics). If such medications are necessary, special care should be taken to ensure the safety of their administration, such as dispensing a week's worth of medicine at a time and/or having a responsible caregiver lock up and directly administer the medication.

Nonpharmacologic Strategies

One of the primary roles of a pediatrician managing a suicidal patient and their family is to provide psychoeduation about the need and support for engaging in adequate treatment. Caregivers may need help in recognizing the seriousness of the child's symptoms. They may also harbor negative feelings and/or misunderstandings about mental health diagnoses and their management options. Pediatricians should try to impress on patients and families the many dangers of untreated mental illness and/or unaddressed psychological stressors (including family discord) and that there are safe, confidential, and effective treatments available. It may be useful to inform caregivers that patients are at the highest risk of reattempting suicide in the months following the initial attempt[40–42] and that, while treatment may take time to help, they should do everything they can to help support the patient in adhering to recommended care.

Determining Level of Care

There are no validated criteria available to guide a pediatrician in assessing level of risk for subsequent suicide and determining level of care needs. However, it is generally agreed that criteria for immediate referral for an inpatient psychiatric admission include any the following:

- Continued desire to die
- Severe hopelessness
- Ongoing agitation
- Inability to engage in a discussion around safety planning
- Inadequate support system/ability to adequate monitoring and follow-up
- High lethality attempt or an attempt with clear expectation of death.

Under certain circumstances, pediatricians must insist on admission to a psychiatric inpatient unit over the objections of patients and/or their guardians. Every state in the United States has laws governing involuntary admission (ie, a "psychiatric hold") for inpatient psychiatric hospitalization. Laws vary from state to state; however, in most cases, physicians are able to admit a patient against his or her will for a brief period of time. Pediatricians should familiarize themselves with the relevant statutes and involuntary commitment procedures in the states where they practice.

Patients who do not meet criteria for inpatient psychiatric hospitalization should be referred for subsequent mental health intervention. Partial hospital programs, intensive outpatient services, or in-home treatment/crisis stabilization interventions should be considered when a patient needs more intensive or urgent treatment than weekly counseling. It should be noted that even patients who are deemed to be at relatively low risk of future suicidal or self-injurious acts still warrant at least some outpatient follow-up. Unfortunately, outpatient mental health providers are not always readily accessible. In those circumstances, primary care providers may need to play an ongoing treatment role, by providing frequent follow-up, bridging care, and/or in-office counseling.[43]

Safety Planning

Although having a patient sign a no-suicide contract has not been shown to prevent subsequent suicides,[44] pediatricians should still engage in a safety-planning discussion. Safety plans typically include elements such as identification of[45]

1. Warning signs and potential triggers for recurrence of suicidal ideation
2. Coping strategies the patient could use
3. Healthy activities that could provide distraction or suppression of suicidal thoughts
4. Responsible social supports to which the patient could turn should suicidal urges return
5. Contact information for professional supports, including instructions on how and when to reaccess emergency services
6. Means restriction.

"Means restriction" refers to counseling families about restricting access to potentially lethal methods. Because a large percentage of suicide attempts are impulsive in nature, educating caregivers about "suicide-proofing" their home is critical. One study of patients aged 13 to 34 who had near-lethal attempts found that 24% of patients went from deciding to attempt suicide to implementing their plan within 0 to 5 minutes, and another 47% took between 6 minutes and 1 hour.[46] Several studies have demonstrated that patients usually misjudge the lethality of their attempts.[34,35,47] There is also a wide variation in the case-fatality rates of common methods of suicide attempt, ranging from 85% for gunshot wounds to 2% for ingestions and 1% for cutting.[48] It thus follows that interventions that decrease access to more lethal means and/or increase the amount of time and effort it would take for someone to carry out their suicidal plan are likely to have a positive effect.

Means restriction education should include recommendations for securing knives, locking up medicines, and removing firearms. It is important to note that parents often underestimate their children's abilities to locate and access firearms[49] and that a gun in the home has been shown to double the risk of youth suicide.[50] Families who are reluctant to permanently remove firearms from the home may be open to temporarily relocating them until the child is in a better emotional state. If families insist on keeping firearms in the home, they should be counseled to secure them with trigger locks, to store them unloaded in a specialized or tamper-proof safe, to separately lock or temporarily remove ammunition, and ensure that minors do not have access to keys or lock combinations. Given the rates of drug and alcohol intoxication among attempts and completers, physicians may also want to recommend restricting access to alcohol and drugs, as well as referral for substance abuse treatment.

Instill Hope

At the conclusion of the visit, the pediatrician should review with the patient their reasons for living. Many patients may need help in generating this list. Pediatricians should highlight any of the patient's stated goals for the future and the ways in which the recommended treatment plan is designed to help the patient not only to survive but also to thrive.

HOMICIDAL IDEATION, AGGRESSION, AND RESTRAINT

Key Points

- Aggression is the final common pathway for a variety of medical and mental health conditions.

- Similar to the approach to the suicidal patient, careful evaluation for potential medical causes that may be the underlying cause and/or may complicate treatment of the aggression is vital.
- Mandatory federal and regulatory standards should guide the use of restraints with children and adolescents, including using the least restrictive methods as possible, frequent reassessment of the need for continued versus discontinuing restraint, and offering of food, drink, and bathroom facilities.
- Physical and chemical restraint may have significant adverse effects and require careful planning, administration, and monitoring.

Introduction

Aggressive, violent behavior is not a diagnosis unto itself but is the result of an underlying medical, toxicologic, or mental problem, or a combination of these conditions. Symptoms vary widely, depending on the patient's age, developmental level, and physical condition, and may include restlessness, hyperactivity, confusion, disorientation, verbal threats, and frank violence toward property, others, or oneself. It is a frequent cause of injury to both patients and medical staff.[51,52] As the evaluation of homicidal ideation and aggression shares many of the priorities and strategies of the evaluation of the suicidal patient, this section focuses primarily on the management of aggressive patients.

Risk factors

Risk factors for aggressive, violent behavior are presented in **Box 1**.

Evaluation

Strategies and priorities for evaluating the aggressive patient are the same as those detailed in the evaluation of the suicidal patient. The first priority is ensuring the safety of the patient and the medical staff. One critical difference with these patients regards the potential victim or victims of future violence. If a potential victim or victims of an aggressive patient are identified, there is an established legal precedent and duty to

Box 1
Aggression/violence risk factors

History of violence (especially recent)
Possession of weapons
Intoxication
Command hallucinations
Impulse control disorders
Concurrent psychosocial stressors
Verbal/physical threats
Psychomotor agitation
Paranoia
Impaired executive functioning
History of antisocial behavior
Concrete plans to harm others

warn the victims of the possibility of future violence.[53] Similar to the situation with the suicidal patient, this duty supersedes patient confidentiality.

When interviewing an aggressive patient, one should use the same techniques as discussed with the suicidal patient. Asking directly about homicidal ideation, thoughts or plans of violence, probing ambiguous or ambivalent statements, obtaining a comprehensive medical, mental health, substance abuse, legal/law enforcement history, inquiring about past and current psychosocial stressors, and access to weapons, from both the patient and the caregivers, should be used. The goal of the physical examination and any laboratory workup is to evaluate for potential medical causes of the patient's aggression as well as to detect any potential injuries or illnesses.

Management Goals

In 1998, the *Hartford Courant* published a series of articles detailing deaths of psychiatric patients, which, it was thought, were attributed to the use of physical restraint.[54] In response to these articles, the Centers for Medicare and Medicaid Services (CMS), and subsequently the Joint Commission for the Accreditation of Hospital Organizations, adopted regulations governing the use of and monitoring requirements for restraint (CMS-3018-F [42 CFR Part 482, RIN 0938-AN30]).[55] Key features of these regulations can be found in **Table 1**.

Nonpharmacologic Strategies

Verbal restraint and staff training in restraint reduction and de-escalation strategies have been shown to be effective at reducing the need for chemical and physical restraint.[56] Common verbal restraint strategies can be found in **Box 2**.[57] The presence of family members, caregivers, and friends is usually calming to a patient, although in some situations they may escalate a patient's agitation. In these situations, asking that person to temporarily leave the room is advisable.

Physical restraint has been associated with adverse outcomes including death. Recommended physical restraint approaches are listed in **Box 3**. Physical restraint should be applied with a minimum of 5 staff, 1 to control each limb and 1 for the patient's head. Restraints made of sturdy (eg, leather) materials should be used, whereas those of less durable construction (eg, "soft restraints") should be avoided. Once a patient has calmed, removal of restraints should be considered. Restraint removal will be dictated by the severity of the patient's condition. In some cases, they may be removed all at

Table 1
Centers for Medicare and Medicaid Services restraint regulations

Regulations apply to both physical and chemical restraint	
Must document need for and monitoring of restraint on 100% of patients	
Restraint Order Time Limit (Time to Renew)	**Monitoring/Basic Care Requirements**
Under 9 y: every 1 h	Visual check: every 15 min or constant observation
9–17 y: every 2 h	Release a restraint: every 2 h (may reapply if needed)
Above 18 y: every 4 h	Neurovascular check: every 2 h
	Offer food/water/bathroom: every 2 h
	Behavior check: every 2 h
	Respiratory status check: every 2 h
	Change physical position: every 2 h

Box 2
Verbal restraint strategies

- Introduce oneself, staff
- Prepare patient for what will happen
- Respect patient autonomy
- Offer food and liquids
- Empathetic listening
- Ask about patient requests/preferences
- Honor reasonable requests
- Nonpunitive limit setting
- Simple direct language, soft voice
- Decrease environmental stimulation
- Allow patient to walk/move in room
- Reassure patient that they will be safe
- Offer distraction (eg, toy/books/movie)
- Nonthreatening movement/posture
- Remove breakable objects, equipment

once; in others, they may need to be removed one at a time with reassessment of the patient's agitation after the removal of each restraint. In every case, the same number of personnel that were present during the placement of the restraints should be available during removal of restraints, in case the restraints need to be reapplied.

Pharmacologic Strategies

Although many first-generation and second-generation antipsychotics have been approved by the Food and Drug Administration for use in children with autistic, mood, psychotic and tic disorders, none have been approved for use in agitation or aggression.[58] There is a growing body of literature on the use of benzodiazepines and antipsychotics for agitated adults in emergency department and psychiatric settings.[59–62] However, very few children were included in these studies and there are no high-quality pediatric trials. In addition, most pediatric agitation studies are from inpatient psychiatric settings, which may not be generalizable to the ED. For both adults and children, agitation in the ED is more likely to be undifferentiated or due to intoxication. These limitations aside, most psychiatric and emergency medicine experts

Box 3
Physical restraint recommendations

- Supine position preferred
- Avoid pressure on neck/back/chest
- Mandatory staff training on restraint
- Avoid covering patient's face/mouth/nose
- Elevate head of bed, if possible

think that these medications are both efficacious and safe, with rare but easily treated adverse reactions.

Table 2 lists commonly used medications and starting doses for pediatric chemical restraint. If a patient is already on one of these medications, administering their usual or an increased dose of that medication is acceptable. Regarding which medication should be used as the first-line agent, most experts recommend tailoring the choice of medication to the severity and underlying cause of the agitation (Table 3). An important caveat is that younger patients and children with autism and other developmental disabilities may have an atypical, idiosyncratic response to benzodiazepines. These patients may become disinhibited and/or their agitation may worsen when given a benzodiazepine.

The most common adverse effects of chemical restraint medications are cardiorespiratory and central nervous system depression, and extrapyramidal reactions. The former are usually easily treated with simple supportive measures, and the latter are usually easily treated with anticholinergics (eg, diphenhydramine, benztropine, or trihexyphenidyl). Rarely are invasive or aggressive treatment measures needed. The most serious acute, adverse effects of antipsychotics are arrhythmias due to QT_c prolongation. These events are rare and are most likely to occur in patients receiving other QT_c prolonging medications and/or with underlying cardiac conditions. Continuous cardiorespiratory monitoring is thus recommended for patients receiving chemical restraint.

CARE OF CHILDREN WITH AUTISM AND DEVELOPMENTAL DISORDERS

Key Points

- Children with autism and other developmental disorders span a wide range of symptoms of severities, ranging from very high functioning with minimal disabilities to profoundly impaired.
- Accordingly, such children may have unique and idiosyncratic communication methods, interaction styles, and responses to sensory stimuli.
- Parents and caregivers are the pediatricians' greatest allies in planning and delivering optimal treatment for their children.

Table 2
Medications for pediatric chemical restraint

Medication	Initial Dose	Onset (min)	Half-life (h)
Diphenhydramine	1.25 mg/kg Teen: 50 mg	20–30 (PO) 5–15 (IM)	2–8
Lorazepam	0.05–0.1 mg/kg Teen: 2–4 mg	20–30 (PO) 5–15 (IM)	12
Midazolam	0.05–0.15 mg/kg Teen: 2–4 mg	20–30 (PO) 5–15 (IM)	3–4
Haloperidol	0.1 mg/kg Teen: 2–4 mg	30–60 (PO) 15–30 (IM)	21
Risperidone	<12 y: 0.5 mg Teen: 1 mg	45–60 (PO)	20
Olanzapine	<12 y: 2.5 mg Teen: 5–10 mg	45–60 (PO) 30–60 (IM)	30
Ziprasidone	<12 y: 5 mg Teen: 10–20 mg	60 (PO) 30–60 (IM)	2–7
Aripiprazole	<12 y: 1–2 mg Teen: 2–5 mg	60–180 (PO) 30–120 (IM)	75

Table 3
Choice of initial chemical restraint agent

	Symptom Severity	
Etiology of Agitation	**Mild/Moderate**	**Severe**
Medical	Benzodiazepine	Benzodiazepine or antipsychotic
Psychiatric	Benzodiazepine or antipsychotic	Antipsychotic

Note. Benzodiazepines may disinhibit and/or worsen agitation in young children and patients with autism or other developmental disabilities.

- Several simple strategies, such as communication adjuncts, transition planning, sensory and environmental modification, and distraction techniques, may be useful in caring for these patients.

Introduction

The incidence of autism spectrum disorders (ASD) is increasing, for a multitude of reasons, many of which are still unclear.[63] The 3 cardinal features of ASD are impaired communication, impaired social interaction, and repetitive/restrictive areas of interest. The severity of these symptoms and the degree of impairment vary greatly and include people who have obtained PhDs (eg, Temple Grandin) to people who are nonverbal and cannot communicate nor care for themselves. In addition, each person may have specific and distinctive interaction patterns and response to stimuli. For all these reasons, caring for these children can be extremely challenging.

Regarding effective treatment strategies for children with ASD, many previous studies suffer from methodologic limitations, such as small sample size, generalizability, lack of blinding or control groups, and so on.[64] Most treatment recommendations, including those in this article, have been based on expert consensus opinion. Fortunately, in recent years, there has been a growth in more rigorously designed studies, including randomized control trials.[65–68]

Children with other developmental disorders (DD) similarly span a wide range of symptoms, severity, and disabilities, too numerous to list and beyond the scope of this article. As the strategies for caring for these children are similar to those used in caring for children with ASD, for the purposes of this article, the term ASD/DD will be used to collectively refer to all these children.

Evaluation

One of the most challenging aspects of caring for children with ASD/DD is interpreting the unique meaning of their behaviors, as well as discovering the optimal methods for interacting with and caring for the child. Fortunately, most of these children are accompanied by an expert in these areas, namely their parent(s) and/or caregiver(s). Time spent asking them about the child is likely to be time well spent, increasing the efficiency with which care is delivered and the patient's, family's, and clinician's satisfaction with the encounter. Suggested topics to discuss with the parent/caregiver are listed as follows:

- What is your child's level of communication, cognitive, and psychosocial functioning?
- How does your child communicate?
- When your child does (behavior), what does it mean?
- What upsets or scares your child? What calms/soothes them?
- Is your child sensitive to light, sound, or other stimuli?

- What's the best way to prepare your child for something new?
- Does your child like to be touched? If so, what types of tactile sensations do they like?
- Are there things (eg, toys, a favorite object, electronic devices) that are good distractions for your child?

Transition Planning

Preparing a child with ASD for what is about to happen is one of the most common strategies used by their caregivers. In ideal cases, the parent/caregiver begins talking to the child about what to expect while en route to the medical setting. Once there, it is worthwhile discussing what will occur during the visit and determining a plan for how to prepare the child for the visit.

Transition planning may also include planned breaks for the child. Some children with ASD/DD are able to stay on task or remain in one location for only brief periods of time. Building rest periods, distractions, bathroom breaks, and so forth into the visit may be an important component to a successful visit. Finally, a method for signaling transitions and/or new activities may also be helpful. A transition cue may be auditory (eg, certain words or phrases, ringing a bell), visual (eg, pointing to a picture, turning on a light, showing the child a certain object), or tactile (eg, a touch with a specific object).

Sensory/Environmental Modification and Distraction

Some patients may be very sensitive to environmental stimuli, such as light, noise, crowds of people, complex/cluttered environments. If a child has such sensitivities, altering their environment and visit may be helpful. For example, instead of sitting in a busy, noisy waiting room, have the child wait in a quiet office or counseling area. Turning the lights in a room off or down, or lighting a room with a single lamp, may help a child who is sensitive to light. A rocking chair or rocking toy (with supervision) may soothe a child who prefers motion. For children who respond to tactile stimulation, a weighted blanket (available through occupational therapy vendors), a radiology leaded vest, or a "bean-bag" chair can all serve to provide the sensation of a heavy touch. Those who prefer the sensation of a light touch may respond to gentle massage (manual or mechanical devices) or stroking the skin with a soft object (eg, a cotton ball, gauze pad, soft blanket). Any toy or electronic device that holds the child's attention and distracts them may assist in caring for the child.

Communication Adjuncts

Visual communication systems, both print and electronic versions, have demonstrated efficacy in improving communication with children with ASD/DD.[68–71] Not only may such a system improve communication with the child, more importantly, it may be the only way the child can communicate with the clinicians. There are a large number of both free and commercial products that are readily available. Alternatively, a system customized to a particular setting can easily be made with digital photographs and/or computerized clip art. A custom visual communication tool has the advantage of containing pictures specific to the site. The disadvantage of such a system, however, is that the patient may not be familiar with it.

REFERENCES

1. Case SD, Case BG, Olfson M, et al. Length of stay of pediatric mental health emergency department visits in the United States. J Am Acad Child Adolesc Psychiatry 2011;50(11):1110–9.

2. Dolan MA, Fein JA, Committee on Pediatric Emergency Medicine. Pediatric and adolescent mental health emergencies in the emergency medical service system. Pediatrics 2011;127(5):e1356–66.
3. Baraff LJ, Janowicz N, Asarnow JR. Survey of California emergency departments about practices for management of suicidal patients and resources available for their care. Ann Emerg Med 2006;48(4):452–8.
4. Santucci KA, Sather J, Baker MD. Emergency medicine training programs' educational requirements in the management of psychiatric emergencies: current perspective. Pediatr Emerg Care 2003;19(3):154–6.
5. Bridge JA, Marcus SC, Olfson M. Outpatient care of young people after emergency treatment of deliberate self-harm. J Am Acad Child Adolesc Psychiatry 2012;51(2):213–22.
6. Grupp-Phelan J, Harman JS, Kelleher KJ. Trends in mental health and chronic condition visits by children presenting for care at U.S. emergency departments. Public Health Rep 2007;122(1):55–61.
7. Kessler RC, Demler O, Frank RG, et al. Prevalence and treatment of mental disorders, 1990 to 2003. N Engl J Med 2005;352(24):2515–23. http://dx.doi.org/10.1056/NEJMsa043266.
8. Lewis M. Child psychiatric consultation in pediatrics. Pediatrics 1978;62(3):359–64.
9. Sills MR, Bland SD. Summary statistics for pediatric psychiatric visits to US emergency departments, 1993-1999. Pediatrics 2002;110(4):e40.
10. Wang PS, Demler O, Olfson M, et al. Changing profiles of service sectors used for mental health care in the United States. Am J Psychiatry 2006;163(7):1187–98. http://dx.doi.org/10.1176/appi.ajp.163.7.1187.
11. Cooper S, Valleley RJ, Polaha J, et al. Running out of time: physician management of behavioral health concerns in rural pediatric primary care. Pediatrics 2006;118(1):e132–8. http://dx.doi.org/10.1542/peds.2005-2612.
12. Heneghan A, Garner AS, Storfer-Isser A, et al. Pediatricians' role in providing mental health care for children and adolescents: do pediatricians and child and adolescent psychiatrists agree? J Dev Behav Pediatr 2008;29(4):262–9. http://dx.doi.org/10.1097/DBP.0b013e31817dbd97.
13. Hoyle JD Jr, White LJ. Treatment of pediatric and adolescent mental health emergencies in the United States: current practices, models, barriers, and potential solutions. Prehosp Emerg Care 2003;7(1):66–73.
14. Hoyle JD Jr, White LJ. Pediatric mental health emergencies: summary of a multidisciplinary panel. Prehosp Emerg Care 2003;7(1):60–5.
15. Sivakumar S, Weiland TJ, Gerdtz MF, et al. Mental health-related learning needs of clinicians working in Australian emergency departments: a national survey of self-reported confidence and knowledge. Emerg Med Australas 2011;23(6):697–711. http://dx.doi.org/10.1111/j.1742-6723.2011.01472.x.
16. Centers for Disease Control and Prevention. Leading causes of death 1999-2010. Atlanta (GA): Centers for Disese Control and Prevention; 2012.
17. Eaton DK, Kann L, Kinchen S, et al. Youth risk behavior surveillance - United States, 2011. MMWR Surveill Summ 2012;61(4):1–162.
18. Ting SA, Sullivan AF, Boudreaux ED, et al. Trends in US emergency department visits for attempted suicide and self-inflicted injury, 1993-2008. Gen Hosp Psychiatry 2012;34(5):557–65. http://dx.doi.org/10.1016/j.genhosppsych.2012.03.020.
19. Brown J, Cohen P, Johnson JG, et al. Childhood abuse and neglect: specificity of effects on adolescent and young adult depression and suicidality. J Am Acad Child Adolesc Psychiatry 1999;38(12):1490–6. http://dx.doi.org/10.1097/00004583-199912000-00009.

20. Esposito-Smythers C, Spirito A. Adolescent substance use and suicidal behavior: a review with implications for treatment research. Alcohol Clin Exp Res 2004;28(Suppl 5):77S–88S.
21. Foley DL, Goldston DB, Costello EJ, et al. Proximal psychiatric risk factors for suicidality in youth: the Great Smoky Mountains study. Arch Gen Psychiatry 2006;63(9):1017–24. http://dx.doi.org/10.1001/archpsyc.63.9.1017.
22. Lewinsohn PM, Rohde P, Seeley JR. Psychosocial risk factors for future adolescent suicide attempts. J Consult Clin Psychol 1994;62(2):297–305.
23. McDaniel JS, Purcell D, D'Augelli AR. The relationship between sexual orientation and risk for suicide: research findings and future directions for research and prevention. Suicide Life Threat Behav 2001;31(Suppl):84–105.
24. McKeown RE, Garrison CZ, Cuffe SP, et al. Incidence and predictors of suicidal behaviors in a longitudinal sample of young adolescents. J Am Acad Child Adolesc Psychiatry 1998;37(6):612–9. http://dx.doi.org/10.1097/00004583-199806000-00011.
25. Shaffer D, Craft L. Methods of adolescent suicide prevention. J Clin Psychiatry 1999;60(Suppl 2):70–4 [discussion 75-6], 113–6.
26. Shaffer D, Gould MS, Fisher P, et al. Psychiatric diagnosis in child and adolescent suicide. Arch Gen Psychiatry 1996;53(4):339–48.
27. Smart RG, Walsh GW. Predictors of depression in street youth. Adolescence 1993;28(109):41–53.
28. Brent DA, Emslie GJ, Clarke GN, et al. Predictors of spontaneous and systematically assessed suicidal adverse events in the treatment of SSRI-resistant depression in adolescents (TORDIA) study. Am J Psychiatry 2009;166(4):418–26. http://dx.doi.org/10.1176/appi.ajp.2008.08070976.
29. Committee on Pathophysiology and Prevention of Adolescent and Adult Suicide, Board on Neuroscience and Behavioral Health, Institute of Medicine. Reducing suicide: a national imperative. Washington, DC: The National Academies Press; 2002.
30. Williams SB, O'Connor EA, Eder M, et al. Screening for child and adolescent depression in primary care settings: a systematic evidence review for the US Preventive Services Task Force. Pediatrics 2009;123(4):e716–35. http://dx.doi.org/10.1542/peds.2008-2415.
31. Foy JM, Kelleher KJ, Laraque D. Enhancing pediatric mental health care: strategies for preparing a primary care practice. Pediatrics 2010;125(Suppl 3):S87–108. http://dx.doi.org/10.1542/peds.2010-0788E.
32. Wintersteen MB. Standardized screening for suicidal adolescents in primary care. Pediatrics 2010;125(5):938–44. http://dx.doi.org/10.1542/peds.2009-2458.
33. Overholser JC. Predisposing factors in suicide attempts: life stressors. In: Spirito A, Overholser JC, editors. Evaluating and treating adolescent suicide attempters: from research to practice. New York: Academic Press; 2002. p. 42–54.
34. Swahn MH, Potter LB. Factors associated with the medical severity of suicide attempts in youths and young adults. Suicide Life Threat Behav 2001;32(Suppl 1):21–9.
35. Brown GK, Henriques GR, Sosdjan D, et al. Suicide intent and accurate expectations of lethality: predictors of medical lethality of suicide attempts. J Consult Clin Psychol 2004;72(6):1170–4. http://dx.doi.org/10.1037/0022-006X.72.6.1170.
36. Santillanes G, Donofrio JJ, Lam CN, et al. Is medical clearance necessary for pediatric psychiatric patients? J Emerg Med 2014. http://dx.doi.org/10.1016/j.jemermed.2013.12.003.

37. Shihabuddin BS, Hack CM, Sivitz AB. Role of urine drug screening in the medical clearance of pediatric psychiatric patients: is there one? Pediatr Emerg Care 2013;29(8):903–6. http://dx.doi.org/10.1097/PEC.0b013e31829e8050.
38. Tenenbein M. Do you really need that emergency drug screen? Clin Toxicol (Phila) 2009;47(4):286–91. http://dx.doi.org/10.1080/15563650902907798.
39. Hetrick SE, McKenzie JE, Cox GR, et al. Newer generation antidepressants for depressive disorders in children and adolescents. Cochrane Database Syst Rev 2012;(11):CD004851. http://dx.doi.org/10.1002/14651858.CD004851.pub3.
40. Spirito A, Plummer B, Gispert M, et al. Adolescent suicide attempts: outcomes at follow-up. Am J Orthopsychiatry 1992;62(3):464–8.
41. Prinstein MJ, Nock MK, Simon V, et al. Longitudinal trajectories and predictors of adolescent suicidal ideation and attempts following inpatient hospitalization. J Consult Clin Psychol 2008;76(1):92–103. http://dx.doi.org/10.1037/0022-006X.76.1.92.
42. Yen S, Weinstock LM, Andover MS, et al. Prospective predictors of adolescent suicidality: 6-month post-hospitalization follow-up. Psychol Med 2013;43(5):983–93. http://dx.doi.org/10.1017/S0033291712001912.
43. Cheung AH, Zuckerbrot RA, Jensen PS, et al. Guidelines for Adolescent Depression in Primary Care (GLAD-PC): II. Treatment and ongoing management. Pediatrics 2007;120(5):e1313–26. http://dx.doi.org/10.1542/peds.2006-1395.
44. American Academy of Child and Adolescent Psychiatry. Practice parameter for the assessment and treatment of children and adolescents with suicidal behavior. American Academy of Child and Adolescent Psychiatry. J Am Acad Child Adolesc Psychiatry 2001;40(Suppl 7):24S–51S.
45. Sher L, LaBode V. Teaching health care professionals about suicide safety planning. Psychiatr Danub 2011;23(4):396–7.
46. Simon OR, Swann AC, Powell KE, et al. Characteristics of impulsive suicide attempts and attempters. Suicide Life Threat Behav 2001;32(Suppl 1):49–59.
47. Plutchik R, van Praag HM, Picard S, et al. Is there a relation between the seriousness of suicidal intent and the lethality of the suicide attempt? Psychiatry Res 1989;27(1):71–9.
48. Vyrostek SB, Annest JL, Ryan GW. Surveillance for fatal and nonfatal injuries–United States, 2001. MMWR Surveill Summ 2004;53(7):1–57.
49. Baxley F, Miller M. Parental misperceptions about children and firearms. Arch Pediatr Adolesc Med 2006;160(5):542–7. http://dx.doi.org/10.1001/archpedi.160.5.542.
50. Brent DA, Perper JA, Allman CJ, et al. The presence and accessibility of firearms in the homes of adolescent suicides. A case-control study. JAMA 1991;266(21):2989–95.
51. McAneney CM, Shaw KN. Violence in the pediatric emergency department. Ann Emerg Med 1994;23(6):1248–51.
52. Knott JC, Bennett D, Rawet J, et al. Epidemiology of unarmed threats in the emergency department. Emerg Med Australas 2005;17(4):351–8. http://dx.doi.org/10.1111/j.1742-6723.2005.00756.x.
53. Felthous AR. The clinician's duty to protect third parties. Psychiatr Clin North Am 1999;22(1):49–60.
54. Busch AB, Shore MF. Seclusion and restraint: a review of recent literature. Harv Rev Psychiatry 2000;8(5):261–70.
55. Centers for Medicare & Medicaid Services (CMS), DHHS. Medicare and Medicaid programs; hospital conditions of participation: patients' rights. Final rule. Fed Regist 2006;71:71378–428.

56. Richmond JS, Berlin JS, Fishkind AB, et al. Verbal De-escalation of the Agitated Patient: Consensus Statement of the American Association for Emergency Psychiatry Project BETA De-escalation Workgroup. West J Emerg Med 2012; 13(1):17–25. http://dx.doi.org/10.5811/westjem.2011.9.6864.
57. Hilt RJ, Woodward TA. Agitation treatment for pediatric emergency patients. J Am Acad Child Adolesc Psychiatry 2008;47(2):132–8. http://dx.doi.org/10.1097/chi.0b013e31815d95fd.
58. Christian R, Saavedra L, Gaynes BN, et al. Future research needs for first- and second-generation antipsychotics for children and young adults. Rockville (MD): AHRQ Comparative Effectiveness Reviews; 2012.
59. Chan EW, Taylor DM, Knott JC, et al. Intravenous droperidol or olanzapine as an adjunct to midazolam for the acutely agitated patient: a multicenter, randomized, double-blind, placebo-controlled clinical trial. Ann Emerg Med 2013; 61(1):72–81. http://dx.doi.org/10.1016/j.annemergmed.2012.07.118.
60. Huf G, Coutinho ES, Adams CE. Rapid tranquillisation in psychiatric emergency settings in Brazil: pragmatic randomised controlled trial of intramuscular haloperidol versus intramuscular haloperidol plus promethazine. BMJ 2007; 335(7625):869. http://dx.doi.org/10.1136/bmj.39339.448819.AE.
61. Knott JC, Taylor DM, Castle DJ. Randomized clinical trial comparing intravenous midazolam and droperidol for sedation of the acutely agitated patient in the emergency department. Ann Emerg Med 2006;47(1):61–7. http://dx.doi.org/10.1016/j.annemergmed.2005.07.003.
62. Hsu WY, Huang SS, Lee BS, et al. Comparison of intramuscular olanzapine, orally disintegrating olanzapine tablets, oral risperidone solution, and intramuscular haloperidol in the management of acute agitation in an acute care psychiatric ward in Taiwan. J Clin Psychopharmacol 2010;30(3):230–4. http://dx.doi.org/10.1097/JCP.0b013e3181db8715.
63. Autism and Developmental Disabilities Monitoring Network Surveillance Year 2008, Centers for Disease Control and Prevention. Prevalence of autism spectrum disorders–Autism and developmental disabilities monitoring network, 14 sites, United States, 2008. MMWR Surveill Summ 2012;61(3):1–19.
64. Mesibov GB, Shea V. Evidence-based practices and autism. Autism 2011;15(1): 114–33. http://dx.doi.org/10.1177/1362361309348070.
65. Adams C, Lockton E, Freed J, et al. The Social Communication Intervention Project: a randomized controlled trial of the effectiveness of speech and language therapy for school-age children who have pragmatic and social communication problems with or without autism spectrum disorder. Int J Lang Commun Disord 2012;47(3):233–44. http://dx.doi.org/10.1111/j.1460-6984.2011.00146.x.
66. Dawson G, Burner K. Behavioral interventions in children and adolescents with autism spectrum disorder: a review of recent findings. Curr Opin Pediatr 2011; 23(6):616–20. http://dx.doi.org/10.1097/MOP.0b013e32834cf082.
67. Gantman A, Kapp SK, Orenski K, et al. Social skills training for young adults with high-functioning autism spectrum disorders: a randomized controlled pilot study. J Autism Dev Disord 2012;42(6):1094–103. http://dx.doi.org/10.1007/s10803-011-1350-6.
68. Gordon K, Pasco G, McElduff F, et al. A communication-based intervention for nonverbal children with autism: what changes? Who benefits? J Consult Clin Psychol 2011;79(4):447–57. http://dx.doi.org/10.1037/a0024379.
69. Ganz JB, Davis JL, Lund EM, et al. Meta-analysis of PECS with individuals with ASD: investigation of targeted versus non-targeted outcomes, participant

characteristics, and implementation phase. Res Dev Disabil 2012;33(2):406–18. http://dx.doi.org/10.1016/j.ridd.2011.09.023.
70. Howlin P, Gordon RK, Pasco G, et al. The effectiveness of Picture Exchange Communication System (PECS) training for teachers of children with autism: a pragmatic, group randomised controlled trial. J Child Psychol Psychiatry 2007;48(5):473–81. http://dx.doi.org/10.1111/j.1469-7610.2006.01707.x.
71. Yoder PJ, Lieberman RG. Brief Report: randomized test of the efficacy of picture exchange communication system on highly generalized picture exchanges in children with ASD. J Autism Dev Disord 2010;40(5):629–32. http://dx.doi.org/10.1007/s10803-009-0897-y.