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Pediatric Suicide Attempts: An Overview of ED Evaluation and Management

Pediatric suicide attempts are common and must be addressed quickly and effectively to decrease risk. This article reviews the current literature and proposes approaches to these highly vulnerable children.

— Ann M. Dietrich, MD, Editor

Introduction

The ED is a common setting for the initial evaluation of emotional and behavioral disorders, including suicidal behavior or attempts. In the United States, approximately 2 million adolescents attempt suicide each year. As the number of visits by adolescents to the ED rises[1,2] and the availability of outpatient mental health services diminishes,[3] the ED physician must be not only able to stabilize the patient medically, but also should be comfortable with differentiating organic from psychiatric disease, performing a targeted psychosocial interview, initiating treatment, and arranging for disposition. This skill set is particularly important, especially given that only about a quarter of EDs in the United States have access to any sort of specialty mental health providers, including child and adolescent psychiatrists.[2] This issue will review the ED evaluation, management, and disposition of suicidal patients, as well as strategies to identify patients at risk for suicide attempts.

Critical Appraisal of Literature

The evidence and literature collected for this review were obtained from PubMed using a search for "pediatric" and "suicide," limited by criteria of time period (1996-present) and English language. There are multiple retrospective articles in the pediatric literature related to guidelines and literature reviews for suicide-related events in children and adolescents. Articles were selected for their relevance to the care of this group in the acute/emergency setting. The majority of articles were retrospective and descriptive in nature, pointing out the salient issues and barriers to care. There were several that reviewed existing literature and set forth guidelines to care for mainly adolescents and suicide-related events. Given that the incidence of child suicide is low, the literature understandably places less focus on this age group.

Epidemiology

Suicide is the third leading cause of death in adolescents ages 15-19 years old (after accidents and homicides) in the United States, and its incidence has increased dramatically over the past few decades. For this group, the suicide rate tripled between the 1950s and 1990s.[4] Since the 1990s, the rates have decreased modestly, coming down by 35% by 2003.[5] According to data from the National Institute of Mental Health, as of 2007, the completed suicide

Executive Summary

- Suicide is the third leading cause of death in adolescents ages 15-19 years old (after accidents and homicides) in the United States, and its incidence has increased dramatically over the past few decades.
- Suicide attempts are more common in girls than in boys (2:1) and often involve ingestions. However, boys are more likely to complete a suicide (6:1) than girls, with firearms being the most common method of completed suicides.
- Organic causes for a patient's presentation must be explored before diagnosing a purely psychiatric or behavioral emergency; oftentimes, this is referred to as "medical clearance" or "focused medical assessment."

rate for this age group was 6.9 per 100,000.[6] On the other hand, for 10- to 14-year-olds, the rate doubled between 1980 and 1996, but is significantly lower compared to older adolescents (0.9 per 100,000).[4]

The total number of suicides in 2007 for both age groups was 1661. Unfortunately, this number has continued to increase. In 2009, the total was 1928: 259 in the 10-14 year-old group, and 1669 in the 15-19 year-old group. Proposed explanations have included increased rates of drug and alcohol abuse, family disorganization, depression (with its variety of inciting events), and access to firearms.

In an attempt to address this issue, the reduction of suicide and suicide attempts has been included in the Healthy People 2010 goals. Unfortunately, detection of suicidal ideation and the presence of predisposing risk factors are complex and fraught with difficulty. Suicide attempts are difficult to quantify, as there is no central reporting agency for this type of injury. In addition, some injuries are not known by health care providers to be suicide attempts. Perhaps one of the few databases that exist is the Youth Risk Behavior Surveillance System, which is a self-reporting survey given to high school students every two years. In the last published set of data from 2009, 13.8% high school students had made a plan to attempt suicide during the preceding 12 months; 10.9% had made a plan about how they would attempt suicide; 6.3% had actually attempted suicide one or more times; and 1.9% had made a suicide attempt that resulted in an injury, poisoning, or overdose that had to be treated by a doctor or nurse.[7]

As an increasing number of adolescents use the ED for routine care, suicidal ideation or self-injurious behavior has become a common cause for pediatric ED visits. During the period 1997–2002, the annual rate of ED visits in the United States for deliberate self-harm was 225 per 100,000 in 7–24-year-olds.[8] About 20% of such ED visits result in either medical and/or psychiatric hospitalization. The estimated ratio of suicide attempts compared to completed suicide is thought to be between 50 and 100:1.[9]

Suicidal behavior varies markedly by gender. Suicide attempts are more common in girls than in boys (2:1) and often involve ingestions. However, boys are more likely to complete a suicide (6:1) than girls, with firearms being the most common method of completed suicides.[5,10] This difference is due to males tending to choose more violent methods (hanging, firearms) and, thus, having a higher likelihood of success. Looking at all suicides, self-poisoning is the most common method used to attempt suicide.

In a review of all suicides and death from undetermined intent from 1977-1991, Zambon et al found that older children and adolescents have more completed suicides than younger children, with a five-fold increase in the rate (ages 7-16 years old, 2.1%; ages 17-21 years old, 10.7%). Completed suicide was highest with hangings.[11] Similar findings have been made in other countries, including the United States, from 1997 on.[4]

The rates of suicide and suicide attempts vary according to race/ethnicity. Among adolescents, Native Americans have the highest risk of suicide, but the completed suicide rate is highest for white males.[12] However, this ranking may soon change, as the gap previously noted between the rates of suicide in white males and black males continues to decrease. Between 1980 and 1996, the completed suicide rate increased most rapidly among black males ages 15 to 19 years (from 3.6 to 8.1 per 100,000).[13] On the other hand, Hispanic adolescents were more likely than their black or white counterparts to report a suicide attempt in the previous 12 months (10 vs. 8 vs. 6 %, respectively).[14] That being said, however, 80% of Latino adolescents with mental health problems do not receive outpatient care due to language barriers and the stigma their culture attaches to such issues.[3]

Unrecognized suicidal intent in the ED is associated with substantial morbidity, potential mortality, and increased health care utilization and costs. Nationally, suicide and attempted suicide cost as much as $33 billion annually. This includes $32 billion in lost productivity and $1 billion in medical costs.[15] For pediatric suicides, these costs factor in not only lost future productivity and medical costs for the child/adolescent, but also the lost "household productivity" of the adults and caregivers affected by these events, due to missed work, deteriorating productivity at work, and resulting medical costs for issues that arise as they attempt to care for these children.

Prehospital Care

Suicidal patients present a unique challenge for prehospital care providers. Patients may require transport and treatment against their will. Concerned family, friends, or random bystanders often dial 911 for assistance without the patient's consent. While some patients will be cooperative, others may refuse transport or treatment. Most suicide attempters will not be severely agitated; however, others may be altered or agitated as a result of drug or alcohol ingestion.

Combative, aggressive, or agitated patients in the field are a risk to themselves and the prehospital providers. For this subset of suicidal patients, prehospital protocols for altered mental status should be followed. If physical or chemical restraints are necessary, they should be used in accordance with protocols developed by the local EMS system's medical director. There is no uniform policy throughout the United States that addresses the paramedic's use of chemical or physical restraints. Pharmacologic agents such as butyrophenones, including haloperidol, are effective and relatively safe in sedating combative patients, although their use in the prehospital setting may not be practical. Benzodiazepines are routinely used in the prehospital setting for the management of patients with seizures, but their use for sedation is not well studied. Caution should be maintained with the use of chemical restraints, depending on what the suicide attempt consisted of (e.g., what medicines/drugs were ingested). Unfortunately, physical restraints or police intervention sometimes remain the only viable options.

The use of physical restraints is a common, though controversial, practice. When a patient's behavior represents an immediate danger to himself/herself or to others, the use of physical restraints is reasonable. In all cases, it is imperative that prehospital personnel use the minimum physical and/or chemical restraint necessary to ensure that the patient is safely brought to the ED without further injury, if possible.

ED Evaluation

Overview. The first goal in the assessment of children presenting after a suicide attempt is to identify and treat acute life-threatening medical emergencies. Organic causes for a patient's presentation must be explored before diagnosing a purely psychiatric or behavioral emergency; oftentimes, this is referred to as "medical clearance" or "focused medical assessment."

Once the child has been deemed medically stable, satisfying the EMTALA requirements, the second goal is to determine whether the medically stable child poses an imminent threat to his or her own life or to the lives of others. This factors significantly into the need for psychiatric hospitalization/intervention. This goal is more elusive and concerning, as it is difficult to identify those at risk for suicide attempt, rather than those who have already tried.

Goals. When interviewing these patients, the history should focus on the chief complaint, as well as details of the presenting symptoms, with particular attention paid to precipitating events (e.g., social stressors). The timing and sequence of events, as well as associated symptoms, may help to distinguish organic from psychiatric conditions. For example, delirium due to drug intoxication has an acute onset with alterations of mental status, whereas psychiatric conditions are usually more insidious, gradually developing over time, and do not affect the mental status.[16]

A thorough review of systems, along with the history of present illness, can yield a wealth of information that can point to a diagnosis. For example, a history of head injury, chronic or progressive headaches, visual changes, vomiting (especially early morning vomiting), and deterioration of motor skills or gait may indicate an intracranial process such as a brain tumor or subdural hematoma. Of particular interest are auditory and visual hallucinations. Auditory hallucinations are often associated with psychosis, whereas visual hallucinations may indicate intoxication. Constitutional symptoms that may provide clues to other organic etiologies, such as a thyroid disorder, include temperature instability, palpitations, and changes in appetite, stool patterns, hair, or skin.

In the past medical history, it is important to identify previous medical or psychiatric problems and their treatment. A review of medications should be done, including adherence to prescribed medication regimens, their efficacy, and any recent changes to the regimen, as well as the use of any over-the-counter or herbal medications. As with many other chronic medical problems, a family history of psychiatric or organic disease may indicate a potential genetic predisposition for these diseases.

In addition to noting these standard components of the child's history, particular attention should be paid to the social history. School performance, extracurricular and social activities, the presence of friends and confidantes, details of the current living situation, any violence in the home environment or any other environment the child is exposed to, any sexual activity the child engages in, and illicit or recreational drug and alcohol use are all important. A useful mnemonic for this portion of the history is HEADSS: Home, Education/Eating, Activities, Drugs, Sex, Suicide (previous attempts or ideation). Identification of the legal guardian of a minor can shed light on the home/social situation and is necessary for consent for treatment and disposition.

Interviewing Techniques. Suicidal ideation and any suicide attempt must always be considered as a serious matter. While the attempt or ideation may be nothing more than a cry for attention, the important fact is that the child even considered suicide as a valid method to make such an outcry. The patient should not be left alone, and the physician should express concern and convey a desire to help. The physician should meet with the

patient and the family, both alone and together, and listen carefully to their problems and perceptions of the issues at hand. It should be made clear that with the assistance of mental health professionals, solutions can be found. The physician should not be afraid of precipitating suicide by direct and frank discussions of suicide risk.

These discussions are delicate and take a good amount of time, making them particularly difficult to manage in a busy ED. Particular care must be taken not to appear insensitive, impatient, or dismissive. These caveats are geared to establish a rapport with the patient, in hopes of getting more accurate information than the parent/caregiver can provide. The physician must be careful not to jump straight to direct, intrusive questions as he would normally do for other medical complaints.[5]

Three main areas should be addressed when evaluating the seriousness of suicidality and the risk for future attempts or completion[17]:

- Suicidal ideation
- Plan
- Intent (the balance between the wish to live and the wish to die).

Content of Suicidal Ideation and Screening Tools. The interview should be comprised of a systematic inquiry about the presence of suicidal ideation, whether the person has explicit plans for self-injury, and a detailed history of past incidents of actual self-harm (including their precipitants, context, and outcome).

Information regarding underlying psychiatric or medical diagnoses and the inciting event also are important when assessing suicide risk. The use of the "MALPRACTICE" mnemonic can help to ensure that all of these areas are addressed:[17] Mental health (established diagnosis and treatments), Attempts (prior, as well as treatment for), Lethality (seriousness of intent and access to mean), Plans (for the future), Risk-taking (activities that can be self-harming in nature), Alcohol and drugs (involvement with attempts and frequency of use), Conflict (precipitant for attempt/ideation), Trauma (history of abuse, witness to violence, or recent loss), Impulsivity (premeditation, planning, discussion with others), Community resources (presence of social support), Exposure (family or media exposure to suicide).

In the clinical setting, this assessment is best done by means of an interview of the child and parents, both separately and together. Oftentimes, these histories can be radically different, as each party tells their view of what happened prior to presentation in the ED. Careful and non-judgmental inquiry can reveal suicidal ideation or behavior previously unsuspected by parents or other caregivers.

Several rating scales and structured instruments have been created to help systematize such inquiry for research and screening purposes. Some of these scales include: Risk of Suicide Questionnaire (RSQ), Suicidal Ideation Questionnaire (SIQ), Suicide Risk Screen (SRS), Suicide Probability Scale (SPS), Behavioral Health Screening, and The Child Suicide Potential Index. Each system has its own set of advantages and shortfalls. In addition, when evaluating these systems for use as screening tools, some thought must be paid to whether the population in the study is similar to the ED population.[18] But, perhaps the bigger problem with many of these screening questionnaires is that while they are detailed and provide great information, they are too long and cumbersome to be utilized in the fast-paced environment of the ED.

The RSQ has received much attention because it is a short and easy-to-use questionnaire, making it appealing for ED providers. In the original study, Horowitz et al created a longer list of 14 questions and compared it against the standard of the validated SIQ.[19] Using the results of their study, the authors singled out four questions that were the most predictive:

- Are you here because you tried to hurt yourself?
- In the past week, have you been having thoughts about killing yourself?
- Have you ever tried to hurt yourself in the past other than this time?
- Has something very stressful happened to you in the past few weeks?

As can be seen, these questions are a subset of the questions that should already be addressed while interviewing these patients. The questionnaire achieved a sensitivity of 98%, specificity of 37%, negative predictive value of 97%, and positive predictive value of 55%. With these statistics, the use of the RSQ will have many false positives, leading to more work-ups. However, given the nature of this disease, having a higher false-positive rate is preferable to a high false-negative rate.

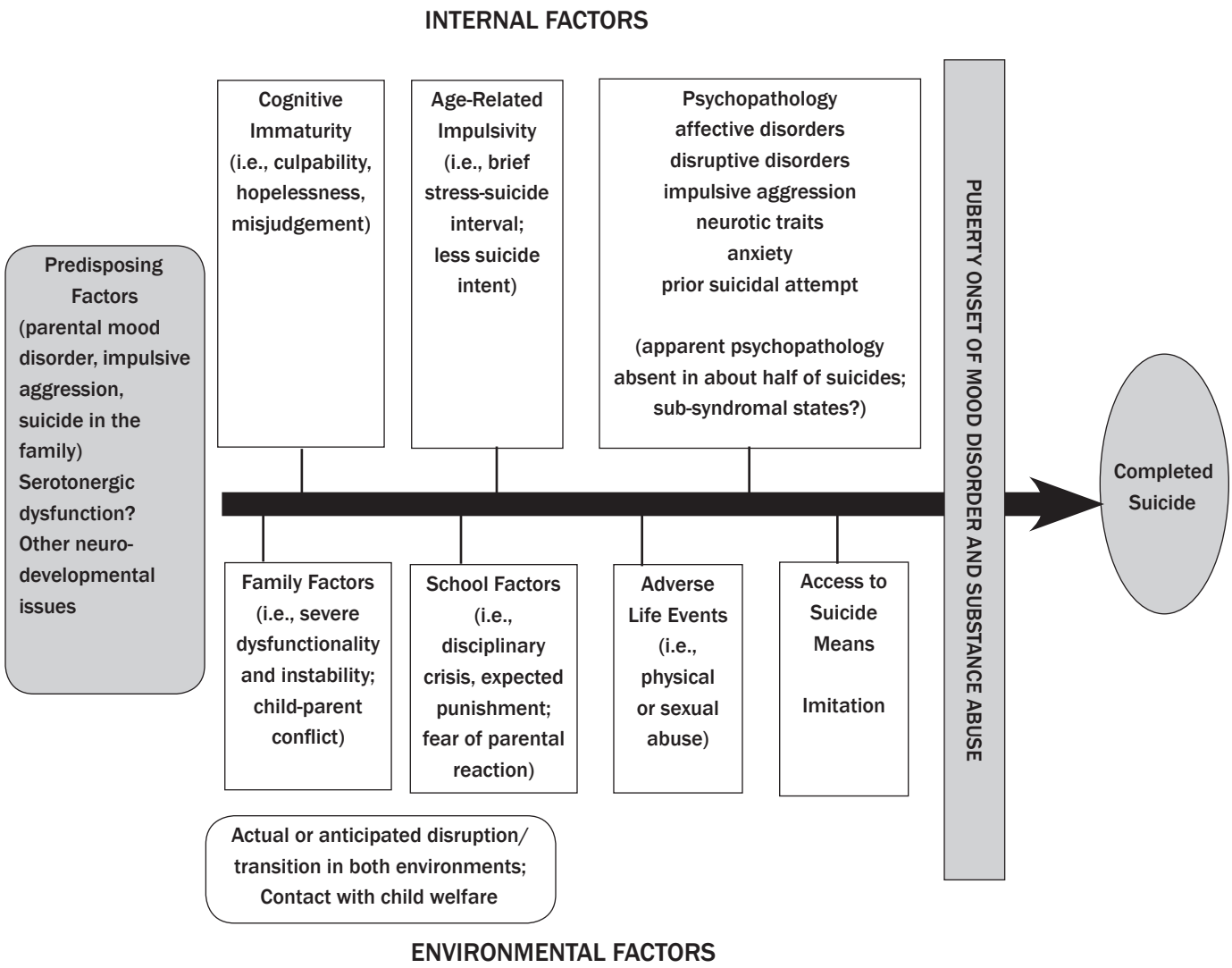
Wintersteen et al proposed a similar algorithm for assessing suicide risk in the pediatric emergency department.[13] The researchers used four questions very close to those in the RSQ, with two initial screening questions (on recent depressive symptoms and suicidal ideation) and two follow-up screening questions (on prior attempts and current plans for a suicide attempt) that help the clinician distinguish between high risk and imminent risk.

Plan/Access to Means and Intent. Because the motivation for suicide attempts is usually fleeting or unclear, it is important to assess the severity of intent, that is, the extent to which the child truly wished to die. Developmentally, a child's concept of death changes with age. After age 9, while a child's concept of death begins to approach that of an adult in which death is ultimately final and inevitable, there is a possibility that the child may still view death as reversible.[20]

The severity of intent may range from a serious, premeditated attempt of high lethality involving a clear wish to die with steps to avoid discovery, to an impulsive overdose of low lethality with someone else being nearby or promptly sought. In the latter case, the wish to die is fleeting.

The lethality of the attempt does not necessarily correspond to the

Figure 1. Risk Factors for Completed Suicide in Ages 14 and Younger



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intensity of a conscious intent to die. Children with low suicidal intent may underestimate the toxicity of medication (e.g., a hepatotoxic acetaminophen overdose), while others with high suicidal intent can underestimate what is needed to be successful in their attempts. In younger patients, this becomes more importan, as the interval between inciting event and the attempt (stress-suicide interval) shortens.[4]

Beyond clarifying the existence of a plan, investigation into access to the proposed means of suicide should be conducted. If a child formulates a plan to commit suicide by shooting himself, but does not have access to a gun, then the likelihood of completion of suicide is low. It does not mitigate the fact that the child was suicidal and came up with the plan; it just means there is less of a likelihood of success.

In assessing the degree of suicidal risk and the need for hospitalization, persistent suicidal ideation, firm intent, high lethality of an attempt, or a history of multiple attempts are all associated with an increased risk of repetition and completion.

The majority of patients who express suicidal ideation and have these particular risk factors, and all who have made a suicide attempt should be referred for psychiatric evaluation and possible hospitalization.

Risk Factors and Warning Signs. Oftentimes, the tendency toward suicide is multifactorial. Perhaps the strongest predictor of completed suicide is a history of a prior attempt. Unfortunately, such previous attempts may or may not have

been identified as suicide attempts. Zambon et al found that a strong association exists between previous hospitalization for any injury and suicide.[11] A family history of suicidal behavior is also significant, increasing the risk up to 5 times. About 10% of child and adolescent suicides have a family history of suicide.[4] Other risk factors can be grouped into internal factors (e.g., cognitive immaturity, impulsivity, and psychiatric disorders) and external factors (e.g., family and school factors, stressful life events, and access to means).

Certain cognitive and personality traits, particularly impulsivity and aggression, and impaired social and problem-solving skills, are important co-morbidities for adolescent suicidal ideation/behavior and provide targets for therapeutic or preventive intervention.[4,12,21]

The presence of a psychiatric diagnosis, such as substance abuse, mood, anxiety, and conduct disorders, is a risk factor for suicide attempts.[22] Approximately 80-90% of all youths who commit suicide have at least one prior psychiatric diagnosis.[12] These psychiatric disorders may not be the primary issue, but a reaction to other developmental stressors such as body changes and the subsequent alterations in self-image. In fact, the pubertal status of a child is thought to be a stronger predictor of psychiatric illness than chronologic age.[4]

In addition to these internal factors, these children have to cope with a multitude of external factors, as well as how they interact. These external stressors can be a variety of things, such as family discord, interactions with peers, or traumatic events. In particular, physical and sexual abuse have been shown in repeated studies to increase risk for suicide overall, both independently and in concert with other stressors such as divorce or difficult parent-child interactions.[4,12,21] Other well-studied and, more recently, well-publicized common stressors that increase risk of suicide are bullying, struggles with sexual orientation, and unwanted pregnancies.[12,21] Not surprisingly, the older the child, the more risk factors that present themselves; and, the more psychiatric and risk behaviors present, the higher the risk for more serious suicidal behaviors and death. Figure 1 is a schematic of how these factors interplay to result in suicide.[4]

These risk factors give one a sense of the baseline risk for suicide attempts in these patients. However, in addition to risk factors, these patients usually have warning signs of an imminent shift from propensity toward suicidal ideation to clear ideation with intent and plan.[9] Most show signs of dysphoric mood (anger, irritability, anxiety, feelings of hopelessness, or depressive symptoms). More than 60% make comments such as "I wish I were dead" or "I just can't deal with this any longer" within the 24 hours prior to death. In one study, nearly 70% of subjects experienced a crisis event, such as a loss (e.g., rejection by a girlfriend or boyfriend), a failure, or an arrest, prior to completed suicide. Sadly, physicians, teachers, and family members often overlook these changes and comments. In fact, 83% of adolescents who attempted suicide were not recognized as suicidal by their primary care physicians.[19] Perhaps even more alarming is the observation that the time interval between the stressor and the suicide attempt is shorter in younger patients compared to older patients.[4]

A mnemonic to help remembering some common warning signs is "IS PATH WARM": Ideation, Substance abuse, Purposelessness, Anxiety, Trapped (i.e., feeling as if there is no way out), Hopelessness, Withdrawal, Anger, Recklessness, Mood changes.[13]

Logistics. From a practical standpoint, children and adolescents with suicidal ideation or behavior should have one-to-one attention until mental health or emergency department personnel can evaluate the seriousness of their intent. Potentially harmful medical supplies and equipment should be removed from the examination room where the patient is placed. To discourage elopement, a hospital gown should be provided to the patient, and his or her clothing should be stored separately. Particular attention should be paid to removing any items that could be used by the patients to harm him- or herself, such as shoelaces, belts, and jewelry. Some institutions have gone so far as to wand these patients with a metal detector to look for hidden or ingested metal items such as pins, nails, or razors.

In addition, most institutions have policies that standardize when a legal form for involuntary commitment needs to be filled out, who will watch these patients (e.g., hospital security, sitters, or nurses), and the procedures for the initiation and maintenance of restraints (chemical or physical). This legal form, sometimes called an involuntary commitment form or a "Certificate Authorizing Transport to Emergency Receiving Facility & Report of Transportation (Mental Health)" form, allows for the detention of a patient suspected of mental illness against his or her will until the patient can be transported to an "Emergency Receiving Facility" for a mental health evaluation. There are several national guidelines for the use of physical restraints in acute settings, such as those from the Joint Commission and from the American Academy of Pediatrics.[23,24]

Physical Examination. The primary goal of the ED physician is to identify life-threatening disturbances of physiology. As with any patient, this begins with an assessment of vital signs and the ABCs: airway, breathing, and circulation. This should be followed by the performance of a detailed neurologic examination.

Alterations in vital signs may provide clues to potential intoxication, ingestion, or organic pathology. Tachycardia, hypertension, pyrexia, and tachypnea may suggest intoxication with stimulants such as amphetamines, cocaine, and ecstasy (3,4-methylenedioxymethamphetamine or MDMA). Assessment for toxidromes, such as anticholinergic

symptoms or salicylate toxicity, may aid in the treatment and stabilization of the child. The pupilary responses, presence or absence of nystagmus, skin temperature and moisture, and condition of the mucous membranes are all helpful in identifying various toxidromes.

The neurologic examination should focus on level of consciousness, gait and coordination, and reflexes; in addition, the Mini-Mental State Examination should be administered. Note the child's affect and general appearance, content and organization of thought, and articulation and expression of speech. Pressured speech with flight of ideas may signal acute mania, whereas echolalia, "word salad," and other disordered thought may indicate acute psychosis.

Signs of previous suicide attempts (scars from cutting), physical or sexual abuse (characteristic bruising patterns, genital trauma), substance abuse (track marks from intravenous drug use, and nosebleeds or perioral blisters from inhalant use), and stigmata of eating disorders (poor dentition, abrasions and lichenification of skin over knuckles, lanugo) should be noted.

Beyond the physical examination, the interaction between the patient and the adult/caregiver present (if one is present) should be noted, as it might give some context on the events leading up to the attempt.

Diagnostic Testing. The differential diagnosis when evaluating suicidal patients is the same as any patient presenting with altered mental status (including agitation, psychosis, or obtundation). Various mnemonics have been suggested to remember this differential diagnosis, including "I WATCH DEATH" (Infectious/inflammatory/immunologic diseases, Withdrawal, Acute metabolic, Trauma, CNS disease, Hypoxia, Deficiencies, Environmental, Acute vascular, Toxins/drugs, Heavy metals) and "AEIOU TIPS" (Alcohol/drugs, Electrolytes/endocrine/encephalopathy, Infections/inflammatory/immunologic diseases, Oxygen/opioids/organ failure, Uremia, Trauma/temperature, Insulin [hypoglycemia, diabetes, diabetic ketoacidosis], Psychiatric, Stroke/space-occupying lesion/shock).

As with any other complaint, working through this differential diagnosis with laboratory tests and imaging should be guided by the history and physical examination. Pubertal girls should have a urine pregnancy test. Urine drug screening can be helpful when intoxication from drugs of abuse is suspected. Serum acetaminophen and aspirin levels should be obtained in children who have ingested drugs or attempted suicide. These medications, as well as ethanol, are common co-ingestions in the setting of a suicide attempt. A measurement of glucose and/or ammonia levels may be useful in obtunded patients; hyperglycemia and hypoglycemia, as well as hyperammonemia, can cause changes in mental status. A 12-lead ECG is useful in cases of ingestion or intoxication to identify conduction abnormalities such as QTc interval prolongation with tricyclic antidepressants, antihistamines, and some of the antipsychotics (e.g., haloperidol and risperidone). A blood gas with co-oximetry can be helpful in cases involving carbon monoxide and other inhalational agents or poisonings.

Screening laboratory tests performed in psychiatric emergencies in which there are no other acute life-threatening conditions requiring stabilization vary by institution. Many inpatient psychiatric facilities require a basic chemistry panel, blood count, urine drug screen, urinalysis, pregnancy test, and screening for thyroid disorders (i.e., TSH, free T4). While these may not be indicated or may have limited utility in the care of the patient in the acute setting of the ED, they may have some utility if the patient is started on a therapeutic regimen.[25]

Imaging studies are rarely indicated or helpful except as indicated by the findings of the history and physical examination. Chest radiographs may identify aspiration in the obtunded, vomiting patient. Abdominal radiographs may identify radiopaque foreign objects or ingestions (e.g., iron pills). Cervical spine radiographs may identify dislocations, fractures, or signs of tracheal rupture in hanging victims. Neuroimaging can help evaluate for intracranial mass lesions or bleeds in those with suggestive history, clinical signs, and symptoms.

Psychiatric Evaluation

Psychiatric evaluation should proceed after the patient is medically stable. The goals of the psychiatric evaluation include:

- Determination of the risk of suicide completion or subsequent attempt;
- Identification of predisposing and precipitating factors that can be treated or modified.

This evaluation should be performed by a clinician who has had specialized training and experience in the psychiatric problems of children and adolescents. In some situations (i.e., if a person with such training is not available), it may be necessary for an ED clinician to perform the initial evaluation to determine whether the patient should be transferred to another facility for a formal psychiatric evaluation. Much of the needed information has already been gathered in the course of the typical ED interview, as discussed above. In some cases, the child or adolescent may have reason to provide inaccurate information (e.g., to avoid hospitalization or the stigma of having a psychiatric illness). For this reason, the information used in the evaluation should be gathered from several sources, if possible, including the child or adolescent, parents or guardians, school reports, previous psychiatric evaluation or assessments, and any other individuals who are close to the child.

ED Management

Medical Stabilization. As discussed above, medical stabilization of the patient who has attempted suicide is the first priority. Traumatic injuries, including lacerations and extremity

Table 1. Commonly Used Medicines for Chemical Restraint

Medication	Initial Dose	Onset of Action (min)	Half-life, $t_{1/2}$ (h)	Comments/Adverse Effects
Diphenhydramine	1.25 mg/kg[b] Teen: 50 mg	5-15 (IM/IV) 20-30 (PO)	2-8 2-8	Paradoxical reaction[a]
Hydroxyzine	1.25 mg/kg[b] Teen: 50 mg	5-15 (IM/IV) 20-30 (PO)	7-10 7-10	Paradoxical reaction[a] Paradoxical reaction[a]
Lorazepam	0.05-0.1 mg/kg[b] Teen: 2-4 mg	5-15 (IM/IV) 20-30 (PO)	12 12	Paradoxical reaction[a]; respiratory depression
Midazolam	0.05-0.15 mg/kg[b] Teen: 2-4 mg	5-15 (IM/IV) 20-30 (PO)	3-4 3-6	Paradoxical reaction[a]; respiratory depression
Haloperidol[c]	0.1 mg/kg[b] Teen: 2-5 mg	15-30 (IM) 30-60 (PO)	21 21	EPS/NMS, transient hypotension, may prolong QTc[d]
Risperidone[e,f]	< 12 yr: 0.5 mg Teen: 1 mg	45-60 (PO) 45-60 (PO)	20 20	EPS/NMS, may prolong QTc[d]
Olanzapine[e]	< 12 yr: 2.5 mg Teen: 5-10 mg	30-60 (IM) 45-60 (PO)	30 30	EPS/NMS, may prolong QTc[d]
Quetiapine	25 mg	45-60 (PO)	6	EPS/NMS, may prolong QTc[d]
Ziprasidone	< 12 yr: 5 mg Teen: 10-20 mg	30-60 (IM) 60 (PO)	2-5 7	EPS/NMS, may prolong QTc[d]

IM, intramuscular; IV, intravenous; PO, oral; EPS, extrapyramidal symptoms; NMS, neuroleptic malignant syndrome.

[a] A paradoxical reaction, such as behavioral disinhibition, agitation, hyperexcitability, and insomnia may occur.

[b] Round dose to nearest milligram or half milligram.

[c] Although not U.S. Food and Drug Administration approved, haloperidol lactate has been used IV (with dosage usually approximated at PO dose × 0.625).

[d] Relative risk for QTc prolongation: ziprasidone > quetiapine > risperidone, olanzapine, haloperidol.

[e] Rapidly disintegrating oral tablet available.

[f] Liquid formulation available.

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fractures, should be treated. The appropriate surgical service should be contacted for management of trauma if it is beyond the scope of practice of the ED physician. These injuries should be taken into account if the child needs to be restrained. Patients whose attempts involve drug ingestion should undergo decontamination and receive antidotes as indicated. Consultation with the regional Poison Center may aid with other recommendations for stabilization and care.

Depending on the patient's mental status, restraints (either physical or chemical) may need to be utilized for the safety of the patient, family, and caregivers.[20] (*See Table 1.*) Before using physical restraints, it is a good idea for both the physician and staff to be familiar with the risks and the benefits for the different types and methods.[16] In some cases, other testing may be needed to assess any secondary injuries from the use of restraints. For example, serum creatine phosphokinase (CPK), urinalysis, and basic chemistry panel (BMP) can be sent to evaluate for rhabdomylosis due to restraints that were too tight or due to severe agitation while restrained.

Disposition

Overview. Children with life-threatening emergencies, such as those making potentially lethal suicide attempts, may require critical care or hospital admission for medical management until they are medically stable. Many psychiatric facilities require that these patients be deemed medically stable for at least 24 hours before accepting them for further care. Those patients whose attempts were not life-threatening or who have suicidal ideation only and who need inpatient care in a psychiatric facility can be transferred to these facilities. Some institutions have psychiatric consult services or agreements with psychiatric hospitals that facilitate these transfers.

Disposition: Psychiatric

Inpatient Hospitalization. Criteria for psychiatric hospital admission include all of the following:

- There appears to be potential for suicide as determined by suicidal ideation with a plan (i.e., both intent and plan).
- There are no available resources for outpatient therapy: either there is no established psychiatrist or the patient would not be able to follow up with his/her established psychiatrist.
- The patient is not able to cooperate with a plan to ensure safety.
- The patient is not able to mentate clearly (e.g., is severely depressed or intoxicated).
- The family, if present, does not appear to be appropriately concerned or capable of caring for patient.
- There are practical limitations on providing supervision and support to ensure safety.

When any of these criteria are fulfilled, admission to a psychiatric facility should be strongly considered, both for the child's safety as well as for definitive psychiatric care.

Even when it seems painfully obvious to the ED physicians and staff that a child needs hospitalization, the family and patient may not agree for a variety of reasons (e.g., fear and misperception of what psychiatric facilities are and do, social stigma of psychiatric illnesses, family history and dealings with facilities in the past, etc.). It may be necessary to consider involuntary hospitalization if the parents or legal guardian of the child are not present and/or are not in agreement with the clinician's plans for hospitalization. The mechanisms for hospitalization of a person who will not or cannot sign himself into a hospital vary from state to state. These mechanisms involve the previously discussed involuntary commitment forms, which allow the medical personnel to override patient or family wishes. Most states require that the patient be a danger to self or others and/or substantially unable to care for him- or herself.

Unfortunately, in many communities, psychiatric facilities that offer inpatient services are limited. This dearth of facilities, along with the scarcity of access to specialty mental health providers (e.g., child and adolescent psychiatry), results in prolonged ED stays. Such stays can go well beyond 24 hours while acceptance to the few facilities is sought; in some cases, these facilities end up being very remote to the patient's location (i.e., in a different city). Also, available psychiatric hospitals are oftentimes selective in which patients they serve, secondary to their criteria of what medical conditions they can and cannot care for (i.e., how they define "medically stable") and to acceptance of the patient's insurance, thus making placement even more difficult.

Disposition: Home to Outpatient Care. Criteria for considering discharge home include the following:

- The patient has suicidal ideation but no plan (i.e., low intent).
- The patient has a therapist he or she can see that day or the next day.
- The patient is able to plan for safety.
- The family is able and agrees to provide supervision and support.

Any decision to send the patient home from the ED without hospitalization should be made only after consultation with a mental health expert. Discharging these patients without a firm, concrete plan for their immediate post-ED care only results in repeated attempts, or worse, completed suicide.[26]

Of note, there is a difference between a "contract for safety" and a "plan" for safety. The "contract" for safety is a "no harm contract," in which the patient signs a contract that he or she will not try to harm or kill him- or herself. These contracts, while reassuring in theory, have not been definitively shown to help, particularly given that many suicides in children are impulsive and have a very short time interval between stressor, intent, and action.[26] Thus, making a "plan" for safety, in which the physician sits down and problem-solves common situations so that the patient knows what to do when they arise, is more desirable. This plan, and phone numbers for crisis services, should be given to the child and the family.

This plan for safety must involve the family and caregivers. An assessment should be made of the family's ability to minimize the risk of successful suicide, to follow through with outpatient therapy, and to provide appropriate support and supervision. In addition to directly supervising and chaperoning these children, the family must also suicide-proof the house, much like the EDs do to the exam rooms for these patients. Anything that can obviously used to complete suicide, such as guns, knives, razor blades, ropes, belts, plastic bags, toxic chemicals, and cleaners, should be secured or removed from the home, and, as much as possible, access to them outside the home must be denied. Medications and over-the-counter drugs should be kept locked in a safe place with all efforts made to restrict access. The patient should be restricted from driving for at least the first 24 hours to lessen the chance of impulsive motor vehicle crashes. In order to ensure the success of an outpatient plan for mental health treatment for these children, both the patients and their families must be committed to it.[3]

Pharmacotherapy

The emergent administration of antidepressants has no role in the acute management of the suicidal adolescent or child. The efficacy of tricyclic antidepressants (TCAs) in childhood and adolescent depression has not been demonstrated, nor is there evidence that the use of TCAs decreases suicide risk. In addition, the small difference between therapeutic and toxic concentrations for these drugs makes them potentially lethal.

Selective serotonin reuptake inhibitors (SSRIs) are usually tolerated better by children and appear to be more promising than TCAs for treating depression. They have low potential for lethality. However, there is some concern that they may increase the risk of suicidality, but

this remains an area of significant controversy.

All medications that are prescribed for the suicidal child must be monitored, and any changes in behavior or side effects must be reported. Treating these patients with medication but without therapy is futile; follow up with a psychiatrist is mandatory.

Areas for Improvement

The unique challenge of caring for children and adolescents with suicidal behavior requires careful deliberation and planning by ED staff. EDs may need to review their care system and modify their physical structure to provide a safe and contained environment for these patients. Potential areas of modification include: more mental health training for their physicians and staff, better access to mental health records and mental health providers if possible (in lieu of more psychiatric facilities for children and adolescents), the development of crisis plans for children and adolescents at risk, provision of additional staff (e.g., security and other personnel who play a role in observation of the at-risk patient), and creation of hospital-wide procedures for the care and observation of these patients.

Summary

1. Suicide attempts, most often poisonings, hangings, and firearm incidents, commonly present to the ED.

2. Certain risk factors and warning signs are correlated with suicidal ideation and attempts: prior suicide attempts, established psychiatric diagnoses (e.g., depression, bipolar disorder), a family history of suicide, external stressors (e.g., family, school), recent dysphoric mood, and recent comments indicative of suicidal ideation, particularly within the past 24 hours.

3. Being familiar with differential diagnosis for agitation (e.g., intoxication and organic conditions that can mimic psychiatric diagnoses), as well as complications of specific traumatic injuries, will help the ED physician establish "medical clearance" for patients presenting with suicide attempts.

4. Algorithms exist for screening patients at high risk for suicide.

5. A detailed physical exam and screening labs are routinely performed to rule out organic causes of disease and are often required by psychiatric facilities.

6. Determining inpatient psychiatric hospitalization versus outpatient follow-up is a crucial component of the management of patients presenting with suicidal attempts and should involve fulfilling specific criteria for either disposition.

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Physician CME Questions

1. What is the most common method for attempted suicide in pediatric patients?
   A. hanging
   B. ingestion
   C. motor vehicle collision
   D. firearms

2. All of the following may be causes of increased suicide attempts in pediatrics *except*:
   A. increased rates of depression
   B. increased rates of alcohol and drug abuse
   C. increased viewing of violent TV programs and movies
   D. increased access to firearms

3. What is the most common method for completed suicide in pediatric patients?
   A. hanging
   B. ingestion
   C. motor vehicle collision
   D. firearms

4. Which of the following is true regarding a history of past suicide attempts?
   A. It is a significant predictor of future suicide attempts.
   B. It suggests that the patient is attention-seeking.
   C. It is only worrisome for patients younger than 13 years.
   D. It is only worrisome if the patient was subsequently admitted to a psychiatric facility.

5. Use of physical restraints in patients presenting with suicidal ideation or attempts is completely safe and without complication.
   A. true
   B. false

6. If the parents refuse inpatient psychiatric hospitalization for their child, per an involuntary commitment form, they are able to take the child home if outpatient follow-up is obtained.
   A. true
   B. false

7. Which of the following risk factors is associated with 5 times the risk of suicide attempt?
   A. family history of suicide
   B. prior suicide attempt
   C. alcohol abuse
   D. depression

8. Which of the following is *not* part of the Risk of Suicide Questionnaire?
   A. recent thoughts about killing oneself
   B. recent ingestion of alcohol or illicit drugs
   C. history of attempting to hurt oneself
   D. recent stressful events

9. Younger children have shorter stress-suicide intervals.
   A. true
   B. false

10. Which of the following is *not* a criterion for discharge home after evaluation for suicidal ideation?
   A. lack of definite plan for a suicide attempt
   B. ability to see a therapist, with whom there is an established relationship, within 24 hours
   C. agreement by the family to closely supervise and support the patient
   D. a "contract" for safety

Pediatric Emergency Medicine Reports

CME Objectives

Upon completion of this educational activity, participants should be able to:

- recognize specific conditions in pediatric patients presenting to the emergency department;
- describe the epidemiology, etiology, pathophysiology, historical and examination findings associated with conditions in pediatric patients presenting to the emergency department;
- formulate a differential diagnosis and perform necessary diagnostic tests;
- apply up-to-date therapeutic techniques to address conditions discussed in the publication;
- discuss any discharge or follow-up instructions with patients.

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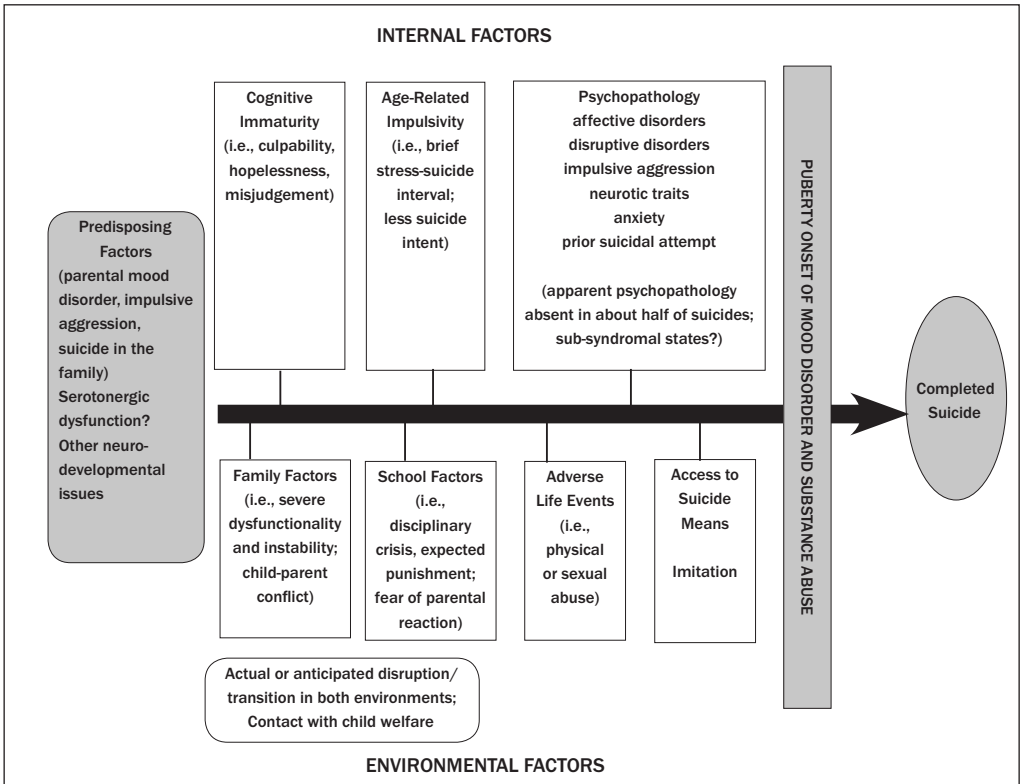
Risk Factors for Completed Suicide in Ages 14 and Younger



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Commonly Used Medicines for Chemical Restraint

Medication	Initial Dose	Onset of Action (min)	Half-life, $t_{1/2}$ (h)	Comments/Adverse Effects
Diphenhydramine	1.25 mg/kg[b] Teen: 50 mg	5-15 (IM/IV) 20-30 (PO)	2-8 2-8	Paradoxical reaction[a]
Hydroxyzine	1.25 mg/kg[b] Teen: 50 mg	5-15 (IM/IV) 20-30 (PO)	7-10 7-10	Paradoxical reaction[a] Paradoxical reaction[a]
Lorazepam	0.05-0.1 mg/kg[b] Teen: 2-4 mg	5-15 (IM/IV) 20-30 (PO)	12 12	Paradoxical reaction[a]; respiratory depression
Midazolam	0.05-0.15 mg/kg[b] Teen: 2-4 mg	5-15 (IM/IV) 20-30 (PO)	3-4 3-6	Paradoxical reaction[a]; respiratory depression
Haloperidol[c]	0.1 mg/kg[b] Teen: 2-5 mg	15-30 (IM) 30-60 (PO)	21 21	EPS/NMS, transient hypotension, may prolong QTc[d]
Risperidone[e,f]	< 12 yr: 0.5 mg Teen: 1 mg	45-60 (PO) 45-60 (PO)	20 20	EPS/NMS, may prolong QTc[d]
Olanzapine[e]	< 12 yr: 2.5 mg Teen: 5-10 mg	30-60 (IM) 45-60 (PO)	30 30	EPS/NMS, may prolong QTc[d]
Quetiapine	25 mg	45-60 (PO)	6	EPS/NMS, may prolong QTc[d]
Ziprasidone	< 12 yr: 5 mg Teen: 10-20 mg	30-60 (IM) 60 (PO)	2-5 7	EPS/NMS, may prolong QTc[d]

IM, intramuscular; IV, intravenous; PO, oral; EPS, extrapyramidal symptoms; NMS, neuroleptic malignant syndrome.

[a] A paradoxical reaction, such as behavioral disinhibition, agitation, hyperexcitability, and insomnia may occur.

[b] Round dose to nearest milligram or half milligram.

[c] Although not U.S. Food and Drug Administration approved, haloperidol lactate has been used IV (with dosage usually approximated at PO dose × 0.625).

[d] Relative risk for QTc prolongation: ziprasidone > quetiapine > risperidone, olanzapine, haloperidol.

[e] Rapidly disintegrating oral tablet available.

[f] Liquid formulation available.

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