Treatment in Psychiatry begins with a hypothetical case illustrating a problem in current clinical practice. The authors review current data on prevalence, diagnosis, pathophysiology, and treatment. The article concludes with the authors' treatment recommendations for cases like the one presented.

Guns, Adolescents, and Mental Illness

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"Connor" is a 16-year-old high school sophomore who lives in a middle-class neighborhood in an exurb of a large urban area. He lives with his father and mother (a police officer and a legal secretary, respectively) and his 11-year-old sister. Connor's parents are seeking a psychiatric evaluation at the suggestion of his school guidance counselor because Connor has had a noticeable decline in both academic and social functioning over the past 6 months. Connor had always been an average student, stronger in writing than in math or science, but his grades have dropped to the point where failing the current school year is a real possibility. Additionally, Connor has missed many classes and has been found sleeping in the school library on numerous occasions. He has changed from a typical adolescent boy with some social awkwardness who had a reasonable number of friends and interests to an isolated, disheveled, and angry loner.

At home, Connor's parents have noticed a change in their son, too. Their once quirky, funny, occasionally rowdy child has seemingly been replaced by a "new" Connor, a young man who stays in his room most of the time, rarely speaks to his parents, and refuses even to have dinner with his family anymore. Connor's father especially misses the closeness and activities they once enjoyed, which included camping, fishing, and hunting together.

A few months ago, Connor's parents took him to see a therapist, who felt that Connor's withdrawal was a "mild" form of "depression." Connor refused to speak to the therapist, so they stopped taking him to therapy after four sessions. The family history is remarkable for the fact that Connor's father has a younger brother who was diagnosed as having paranoid schizophrenia. For this reason, Connor's father is particularly worried about Connor, but he is hopeful that Connor is just going through an adolescent phase. Given the family history of psychiatric illness, Connor's parents are interested in a psychiatric consultation that will, they hope, put their fears to rest.

Connor's parents call every psychiatrist and child and adolescent psychiatrist in their insurance plan in hopes of arranging a prompt psychiatric evaluation for their son. The soonest appointment they can get for him is in 3 weeks. During the intervening period, Connor markedly decompensates. At home, he has started to have angry and destructive outbursts, punching holes in his bedroom walls and accusing his parents of "messing" with him when he is asleep. One day at school he flings a notebook across the classroom and accuses his science teacher of being an "operative" who is trying to get him to take "poisoned isotopes." Connor then throws a punch at this teacher, who restrains him while the school security guard is summoned. The teacher and a security guard are able to keep Connor isolated in the classroom while the police are called to transport him to the psychiatric emergency department.

Connor becomes extremely agitated while the police are escorting him to the car, and the police officers apply handcuffs in order to maintain safety. While Connor is being transported to the emergency department, his science teacher notices Connor's backpack on the ground and picks it up. As it feels noticeably heavy, he opens the bag, and in addition to many scraps of paper with angry phrases jotted on them, he finds a large, loaded handgun.

In the emergency department, Connor is physically restrained because of his continued agitation. He is treated with 5 mg of haloperidol, 2 mg of lorazepam, and 1 mg of benztropine intramuscularly. After about 3 hours, he is calm enough to be

interviewed in a secure isolation room. Connor's parents and the police are informed about the handgun found in Connor's backpack, which turned out to be one of the many in his father's collection. All of the laboratory studies obtained in the emergency department, including a toxicology screen, are unremarkable.

Connor is extremely suspicious but is at least minimally cooperative during the emergency department interview with the psychiatrist on call. He is able to tell the psychiatrist about his complex delusional system, which started at the beginning of the school year when he was cut from the junior varsity cross country team. His plan today had been to kill those among the staff and students at his school who he felt were involved in a complicated conspiracy to "erase" him.

Connor is admitted to a locked adolescent psychiatric unit 40 miles from his home. He initially refuses oral medications, and intramuscular administration of haloperidol is needed once or twice daily because of his continued physical agitation and verbal threats. On day 5 of his hospitalization, Connor's symptoms of psychosis begin to show improvement. His parents feel that the first symptom to improve is his withdrawal; he is warmer and more talkative, and he is affectionate for the first time in months. He starts to comply with the prescribed oral antipsychotic medication regimen—an atypical antipsychotic that is slowly titrated during the remainder of his 12-day inpatient stay. He remains moderately convinced that his delusional system is real, and he begs his parents and his psychiatrist not to make him return to school. His parents are counseled about the risks of suicide and homicide in a youngster with a psychotic disorder. The psychiatrist emphasizes the need for continued medication adherence after discharge. He also discusses issues pertaining to access to firearms. Connor's parents are advised to remove all firearms from their home, including the father's service weapon, if possible. Also discussed is the need for meticulous supervision for Connor once he is discharged to ensure that he does not acquire another weapon.

After 12 days in the hospital, Connor is no longer agitated and is only minimally convinced of the reality of his delusions, and he is released. Weekly outpatient appointments are arranged with a psychiatrist for the next 6 weeks, and he continues to benefit from medication treatment. He returns to his high school for two classes per day initially, with a plan to gradually reintegrate fully.

Connor soon stops taking his medication, although his parents are not aware of it because he is "cheeking" the tablets and spitting them out when he is alone. He later states that he stopped taking his medication because of his distress over a weight gain of almost 20 pounds. Within a couple of weeks, he begins again to withdraw from the family, and his father finds him trying to break open the locked tackle box where he stores his service weapon.

Connor's parents are able to get an emergency appointment that day with Connor's psychiatrist, who starts him on a new antipsychotic in a liquid suspension to minimize the possibility of his cheeking the medication. Connor's parents are given detailed instructions on how to check Connor's mouth after they give him his medication, and they are advised to use the psychiatric emergency department if his condition continues to deteriorate. Connor responds quickly to the new medication, and after about 2 weeks he is close to his baseline functioning. His psychiatrist refers him to work with a dietician to help avoid further weight gain. With gradual changes in his diet and eating behavior, along with increased physical activity, Connor is able eventually to lose 15 of the 20 pounds he had gained, and he continues to have excellent adherence with the new medication.

Connor and his family are referred to a therapist for education about the symptoms of relapse in schizophrenia, stress reduction, and safety. His school refers him to a day treatment school program for the remainder of the year. Connor adjusts well to the program, and the decision is made to have him remain in this therapeutic environment until he completes high school.

The mass murder-suicide perpetrated by Seung-Hui Cho at Virginia Tech in April 2007 resulted in 33 deaths. This may well be the worst incident of mass murder perpetrated by a seriously ill offender, and it has stirred the

national debate on the link between psychiatric illness and violence. Initial information about Cho's background and history suggests a young man with a long history of social isolation and rejection, idiosyncratic social behaviors, and fascination with violent themes. He was, at one time, court-ordered to undergo mental health treatment after he was accused of stalking two female students, although he was released from mandatory treatment by a physician at the local mental health center. In addition to increasing public fears of individuals with mental illness, the shooting has also renewed our country's debate about gun rights versus gun control.

Guns and Public Health Implications

The United States has one of the most heavily armed populations in the world. Recent findings show that 39% of all U.S. households have a firearm on the premises. Of households that include an adolescent, 20% have at least one firearm in the home. About one-third of those firearms are stored unlocked, one-fifth are stored loaded, and one in 12 are stored loaded and unlocked (1). Typically in households where there are both firearms and children, parents are not aware of the extent to which their children are knowledgeable about the location of the guns and ammunition. This increases a youth's risk of both intentional and unintentional injuries; fully one-third of children and adolescents reported handling a firearm within the household (2). Although almost all adolescent gun use is associated with hunting, usually with the father (3), 5% of adolescents who have handled guns report unsupervised use, and half of those have actually fired the gun without supervision (4).

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Guns are the weapons used in most homicides in the United States, as well as in the majority of completed suicides. Although young people in the United States are no more prone to serious psychiatric illnesses than youths in the rest of the world, the relative ease with which any American can obtain a firearm makes those vulnerable youths potentially more likely to act on suicidal or homicidal ideas with a highly lethal weapon. Because of the prevalence of gun-related morbidity and mortality, surgeons, emergency physicians, family practitioners, pediatricians, and psychiatrists have worked to increase their ability to identify those youths at risk of homicide or suicide and to increase referrals for behavioral intervention in this population (5). One area of primary prevention that could be of benefit is the emphasis on primary care physicians addressing issues relating to gun safety for all youths. Just as ubiquitous guidance provided to parents by pediatricians on the "back to sleep" infant positioning has reduced the incidence of sudden infant death syndrome by 50%, one might hope that increased parental guidance and screening of children and teens will reduce the frequency of gun-related deaths (6).

When children suffer from psychiatric disorders that put them at risk of suicide or homicide, their families should be encouraged to understand that for the risk to be reduced, youths should have no possible access to firearms—that is, that there should be no firearms in the house. If that is not possible, attempts should be made to convince families that their guns should be stored locked and unloaded, with ammunition stored and locked in a separate location (7). Families with depressed or potentially self-injurious youths who do have firearms at home should be repeatedly screened for gun safety; a recent study (8) found that only 26.9% of such families removed the firearms from their homes after they were encouraged to do so, and 17.1% of families with a depressed adolescent and no firearms had acquired firearms within 2 years (8).

Identification and Treatment of Early-Onset Schizophrenia

Although childhood-onset schizophrenia is rare, onset of the disorder during adolescence is relatively common. In fact, some studies have reported that more than one-third of patients who develop schizophrenia have their onset of psychosis before their 18th birthday. Early-onset schizophrenia is often associated with dysfunction in cognitive, social, and motor domains that predates both the first psychotic symptoms and the illness's prodrome. Compared with the adult-onset form of the illness, early-onset schizophrenia more frequently has an insidious onset, such that even parents are often unable to identify a clear beginning of the illness. Early-onset schizophrenia is also associated with poorer outcome and poorer adaptive functioning between exacerbations of symptoms compared with later-onset schizophrenia.

Although symptoms of psychosis in children under age 12 may be markedly different from those of adults, adolescents can and do present with delusions, hallucinations, and disordered thought that are similar to the illness manifestations in adults (9). Although atypical antipsychotics appear to be prescribed more frequently than conventional neuroleptics to youths with schizophrenia, there is still a dearth of published evidence from randomized controlled clinical trials pertaining to the pharmacotherapy of adolescents with schizophrenia. As a result, psychiatrists often must resort to weighing relative risks and benefits of medications on the basis of adult clinical data. This situation is particularly unfortunate, since adult data on psychotropic agents historically have not been an accurate predictor of safety or efficacy in pediatric patients (10). For example, a recent review of 77 clinical trials of antipsychotic medications in children and adolescents found that only a handful of studies focused on schizophrenia and its related spectrum disorders in adolescents (11).

Once an antipsychotic is prescribed for schizophrenia, it usually takes longer for youths than adults to achieve recovery. Youths also appear to be at greater risk than adults of developing extrapyramidal side effects and weight gain when treated with antipsychotics. This is a particularly important consideration because young people with schizophrenia are likely to need medication for many years and are thus more vulnerable to the development of long-term adverse effects, including tardive dyskinesia, obesity, hyperlipidemia, and hypercholesterolemia.

As with the patient in the vignette, the weight gain associated with some atypical antipsychotics may directly lead to nonadherence to the medication regimen, particularly in adolescents, who are especially sensitized to threats to their body image. The savvy physician not only will include weight management and exercise as integral components of the treatment plan for a teenager with schizophrenia but also will closely monitor height, weight, and body mass index. For youths who show evidence of excessive weight gain, timely referral to a dietician and incorporation of a daily exercise regimen can often prevent lifelong health impairments as well as medication nonadherence leading to illness exacerbation.

While supportive psychosocial interventions such as cognitive behavior therapy and family therapies appear to help patients with psychosis recover more quickly (when combined with an effective medication regimen), there remains a need for further controlled studies that can help inform clinicians on how to tailor specific therapies to individual patients (12). Multiple-family group treatment, in which five to eight families with a member with schizophrenia meet as a group for a limited number of sessions, has demonstrated an association with fewer psychiatric hospitalizations in comparison with a control group (13).

Finally, because early-onset schizophrenia is associated with significant learning and social difficulties, it is important for the treating physician to communicate effectively with school personnel to help educators develop appropriate accommodations for the youth in the least restrictive teaching environment.

Schizophrenia and Risk of Violence

Unfortunately, a diagnosis of schizophrenia may be associated with higher rates of violent behaviors in symptomatic individuals. The risk of violence is compounded in patients who have a past history of interpersonal violence, as well as those who have a comorbid substance use disorder. A recent large study (14) of people diagnosed with schizophrenia found that 19.1% engaged in violent behavior during the 6-month study period, with 3.6% engaging in seriously violent behavior. The presence of positive symptoms of schizophrenia was shown to be a predictor of violence (14).

Beyond generally elevated rates of violent behavior, it has also been noted that a diagnosis of schizophrenia puts the patient at a much higher risk of committing a homicide than an unaffected individual. A recent report (15) found that 5% of all individuals convicted of homicide in England and Wales during a 3-year period had a diagnosis of schizophrenia (15). Simply having a diagnosis of schizophrenia increases one's risk of committing a homicide by a factor of 10 compared with unaffected individuals, and an added comorbid substance use disorder increases the risk by a factor of 17 (16). The risk of violent behaviors, including homicide, for individuals with a diagnosis of schizophrenia is highest in the first year after the diagnosis is made, and first-degree family members are the most frequent victims of aggressive acts. A recent report (17) on a series of 22 patients who committed homicide during the first year of a psychotic illness noted that more than 80% had murdered a relative and that almost none had received any mental health treatment prior to their offense, despite at least a year of symptoms of psychosis.

Given such data, it may not be surprising that the general public perceives patients with serious psychiatric illnesses as dangerous (18). However, what is perhaps most unfortunate is the assumption that there is no difference in the risk of violence between treated psychiatric patients and those without a psychiatric disorder. In fact, it is the active symptoms of mental illness that increase the risk of dangerousness, not the psychiatric disorder per se (19). These findings all demonstrate the need for special vigilance on the part of the clinician regarding monitoring for safety-related issues, as well as the inclusion of family members and other supportive services in the overall treatment plan, in the effort to reduce the risk of violent or self-destructive behavior in patients suffering from psychotic illnesses.

Reducing Risk

High-profile homicides perpetrated by individuals with psychotic illnesses will continue to inspire the media and some public officials to call for reinstatement of antiquated methods to limit the risk that patients with such illnesses pose to society. However, recent studies suggest that in the era since policies of deinstitutionalization returned such patients to the community, the proportion of homicides committed by persons with schizophrenia has remained the same (20) or perhaps even decreased. In the United Kingdom, during the era of institutionalization, 35% percent of homicides were perpetrated by the seriously mentally ill; since 1984, less than 20% of homicides were perpetrated by this population (21). Thus, clinicians can best advocate both for the patient and for primary violence prevention by ensuring adequate access to community-based outpatient treatment for those with schizophrenia. Community-based treatment has been shown to be effective in ensuring the delivery of appropriate therapeutic and medication-somatic services for most patients; there does not seem to be any added protection or benefit to intensive case management compared with standard case management (22).

Part of the standard psychiatric care given to individuals with schizophrenia, and especially those at highest risk of violent behavior, must include regular risk assessment, although there is still much debate about the usefulness of standardized instruments versus clinical assessment

based on training and experience (23). Certainly, repeated interviews in which patients are asked about violent thoughts, command hallucinations, persecutory delusions, substance use, and access to firearms are recommended. It is also important to collect collateral information from family members, teachers, and others who have frequent contact with adolescents and young adults. It is highly advisable to have young patients sign release-of-information forms as soon as they are able to consent, as family members often notice symptoms of relapse before a patient reports such symptoms or exhibits behavioral deterioration in the office setting. Finally, adherence to a treatment regimen that includes effective antipsychotic medication is essential in ensuring optimal care for the patient while reducing the risk of harm befalling the patient, the patient's family, or others in the community. Given that adherence to medication regimens, whether oral or depot formulation, is less than 50% for patients with schizophrenia (24), repeated inquiry with the patient and family regarding missed doses, along with discussion of the need for continued treatment, is important.

For adolescents in particular, given their developmentally expected concerns about bodily appearance, adherence may be enhanced by careful monitoring of weight and provision of guidance on nutritional intake and exercise. When necessary, referral to a dietician and other measures should be considered.

In short, when working with adolescents suffering from psychotic illnesses, it is important for clinicians to work with both the patient and those in the patient's support systems to ensure that these youths have the best opportunity to achieve recovery while minimizing the risk of potentially tragic outcomes.

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