Primary and Secondary Prevention of Youth Suicide

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Youth suicide is a national and global public health crisis. Pediatricians can use primary and secondary prevention strategies to intervene with youth before or after the onset of suicidal behaviors. Universal suicide risk screening programs can be used to identify youth in medical settings who may otherwise pass through the health care setting with undetected suicide risk. Pediatricians are uniquely positioned to help foster resilience in their young patients and equip families of at-risk youth with safety plans and lethal means safety counseling. Pediatricians on the frontlines of this critical public health crisis require education and training in detecting suicide risk, managing those who screen positive, and connecting their patients to much needed mental health interventions and treatments. Evidence-based suicide risk screening and assessment tools, paired with interventions, are feasible and potentially life-saving in the medical setting.
Youth suicide is a major global public health crisis. In the United States, suicide rates continue to rise, despite many decades of prevention efforts. In this article, we will describe the increasing rates of youth suicide, suicidal behavior, and ideation in the United States and discuss evidence-based strategies pediatricians can use in primary and secondary prevention. The gaps in our current knowledge and areas for future research will also be addressed.

**YOUTH SUICIDE: A BRIEF EPIDEMIOLOGIC OVERVIEW**

Suicide is the second leading cause of death for young people 10 to 24 years of age in the United States and worldwide. In 2017, suicide accounted for 25% of all injury-related deaths for this age group, with a rate of 10.57 per 100,000. In addition, more young people died by suicide than the top 17 leading medical causes of death combined. American Indians and Alaska Natives; lesbian, gay, bisexual, transgender, and queer or questioning youth; individuals with neurodevelopmental disorders; and children in the foster care system are at greater risk for suicidal ideation and behavior.

Although underrepresented in current research, preteens and younger children think about, plan, and die by suicide. Among children 5 to 12 years of age, suicide is the fifth leading cause of death. Notably, suicide rates in youth 10 to 14 years of age are the fastest growing, with rates of suicide now exceeding death by traffic accidents. Bridge et al uncovered a significant racial disparity for children <12 years of age, with African American children dying by suicide at higher rates than white children; this trend completely reverses at 13 years of age, but limited data do not explain why. In recent trends, it is shown that visits to emergency departments (EDs) for suicidal behavior have doubled over time, with nearly half the increase due to visits by preteens.

**SUICIDE TERMINOLOGY**

Phrases like “committing suicide” or “successful suicide” are no longer considered appropriate terms for pediatricians and researchers to use. Such phrases are discouraged as they carry negative, blaming connotations and mislabel suicidal behavior as something that may be successfully accomplished. Instead phrases such as “die by suicide” or “completed suicide” are now more acceptable.

**SUICIDE RISK AMONG PATIENTS IN MEDICAL SETTINGS**

In many studies, researchers have identified medical illness as a risk factor for suicide in adults and youth. Youth with chronic medical conditions have increased contact with their pediatricians, allowing opportunities for detection of suicide risk. Medical settings are well positioned to screen for suicide risk. Death registry studies reveal that the majority of young suicide decedents (80%) have visited a health care setting months, sometimes weeks, before death, and only 20% had contact with a mental health professional. Importantly, >1.5 million young people will have an ED visit as their sole contact with the health care system, which may be the only opportunity to recognize their distress and intervene. Despite these statistics, few pediatric health care settings screen for suicide risk, and fewer use evidence-based methods.

**PRIMARY PREVENTION STRATEGIES**

There is rarely a single cause of a death by suicide but rather a combination of genetic and environmental risk factors, as well as precipitating events. Suicidal thinking in childhood is the gateway to adult psychopathology and suicide attempts, making early detection and intervention a public health imperative. Primary prevention strategies aim to prevent the onset of suicidal thoughts and behaviors by mitigating the effects of internal and external risk factors. Potential prevention approaches include fostering resilience in young patients, promoting peer and family connectedness, and intervening on parent psychopathology.

A young person’s ability to adapt to stress and adversity is essential for healthy development. Pediatricians, as de facto mental health providers, can be trained to help youth navigate emotional distress by suggesting individualized coping strategies to tolerate frustrations and persevere through failures, thus intervening before the onset of psychiatric symptoms. Pediatricians can promote resilience by highlighting the patient’s strengths, encouraging self-efficacy, teaching effective problem-solving skills, and identifying protective factors, such as strong social connections, engagement in mental health treatment, and strong religious and spiritual beliefs.

In some studies, researchers have found that increased feelings of school and peer connectedness are related to lower reports of suicidality among students. In addition to peer support, familial and community support are protective factors against suicidal behavior. Furthermore, research suggests a strong relationship between child and parent mental health, such that parents with mental illness are more likely to have children with psychiatric symptoms. Notably, intervening and mitigating parental depression has been shown to reduce depressive and suicidal symptoms and promote better health outcomes for their children, turning a risk factor into a protective factor.
SECONDARY PREVENTION STRATEGIES

Risk Factors and Warning Signs of Suicidality

Secondary suicide prevention efforts are aimed at detecting youth at risk for suicide and recognizing those exhibiting warning signs. Known risk factors for suicidal ideation and behavior include previous suicide attempt, mental illness or substance use disorder, family history of suicide, childhood abuse, trauma or neglect, impulsive or aggressive tendencies, isolation, hopelessness, interpersonal loss, and medical illness.32,33,39 However, most youth who experience one or more of these risk factors will not die by suicide, as is true of most risk factors for any serious medical condition. Yet, being aware of warning signs can be invaluable and can help pediatricians intervene with youth who are displaying signs of imminent risk. Possible warning signs include talking about wanting to die or killing oneself, which, no matter what age, should always be taken seriously; looking to obtain lethal means to kill oneself; talking about feeling hopeless, helpless, or having no reasons to live; feeling like a burden to others; experiencing insurmountable pain; increased use of alcohol or drugs; increased agitation, anxiety, or recklessness; and sleeping too much or too little or not wanting to get out of bed in the morning.

Detecting Suicide Risk in the Medical Setting

Suicide is one of the most frequently reported Sentinel Events to The Joint Commission (TJC) among behavioral health and medical patients. A significant percentage of Sentinel Event suicides reported to TJC occur in nonbehavioral health units (eg, ED, ICU, inpatient medical or surgical units).41,42 In 2007, TJC issued National Patient Safety Goal 15,43 stating that all behavioral health patients are required to be screened for suicide risk in psychiatric and general medical settings. In 2016, TJC broadened this alert by issuing Sentinel Event Alert 56,41 recommending that all patients in medical settings be screened for suicide risk using standardized, evidence-based screening tools. The National Action Alliance for Suicide Prevention44 and the American Academy of Pediatrics45 have also supported implementing suicide risk screening procedures in medical settings and increasing provider education about suicide risk among medical patients.

The number one root cause of suicide Sentinel Events is lack of assessment for suicide risk.41 Most often, patients present with somatic chief complaints and will rarely initiate conversations about their suicidal thoughts if not asked directly, “Are you having thoughts about killing yourself?” Pediatricians should not rely solely on clinical intuition or evidence of warning signs of suicidality to screen a patient; such screening should be universally systematic with young patients 10 years of age and older.46

Pediatricians will need clinical pathways that include both screening and assessment tools,46 which each serve different functions. Screening tools are used to rapidly identify patients who require further assessment. Subsequently, assessment tools guide pediatricians in a more comprehensive evaluation of risk to determine the next steps of care.

Screening Tools and the Youth Suicide Risk Screening Clinical Pathway

It is important to use tools that are evidence-based for the population in which they are intended to be used. The Ask Suicide-Screening Questions (ASQ; see Fig 1) is an example of an evidenced-based suicide risk screening tool for medical and behavioral health pediatric patients approved by TJC.47 The ASQ is a brief screening tool containing 4 yes or no questions developed to assess suicidal ideation and behavior. A positive screen result on the ASQ will flag a patient who needs further risk assessment. The ASQ was developed in the pediatric ED with 96.9% sensitivity, 87.6% specificity, and takes 20 seconds to administer. Current studies validating the ASQ among youth in inpatient and outpatient settings, and in adult medical patients, are showing promising psychometrics. An online ASQ toolkit was created to assist medical settings with implementation, including scripts for nurses and medical assistants, flyers for parents, and brief suicide safety assessments (BSSAs) (www.nimh.nih.gov/ASQ).

Recently, youth suicide risk screening clinical pathways,46 sponsored by the American Academy of Child and Adolescent Psychiatry, were published to provide physicians with step-by-step implementation instructions. These pathways were designed to allow each medical setting the flexibility needed to adapt their screening programs depending on available staff and resources. The pathways outline a 3-tiered system: (1) nurses and medical assistants administering the ASQ as a brief screen; (2) mental health clinicians, nurse practitioners, physician assistants, or physicians conducting a BSSA using the Columbia-Suicide Severity Rating Scale48 or the ASQ BSSA47; and, if necessary, (3) a full mental health evaluation. The critical second step of the BSSA allows physicians to choose next steps for patients who are at varying intermediate levels of risk for suicide. An ASQ BSSA has been developed specifically for pediatricians for specific venues. The pathways are meant to be individualized according to each institution’s culture and, if implemented thoughtfully, can make screening more feasible and spare strapped mental health resources.
Depression Screening Versus Suicide Risk Screening

Some medical settings use depression screening tools to screen for suicide risk, such as the Patient Health Questionnaire–9,49 the modified Patient Health Questionnaire–Adolescents,50 or the PHQ–M51 for adolescents. Although validated to screen for depression, the questions on these tools have not been validated to specifically identify suicide risk. In studies, researchers have found that depression screens underdetect patients who die by suicide.52,53 Not all youth who die by suicide have clinically significant depression,54 suggesting that screening for depression may not be sufficient to detect suicide risk.55,56 In similar data in pediatric medical inpatients, it was found that using only the Patient Health Questionnaire–Adolescents to screen for suicide missed 28% of pediatric patients at risk.57 In addition, there is also no empirical evidence to support the all too common and tedious practice of sequentially screening a patient first with the Patient Health Questionnaire–2; then, if positive, administering a Patient Health Questionnaire–9; and then, if still positive, administering a suicide risk screen. Asking directly about suicide with validated suicide-specific screening instruments is the best way to accurately identify patients at risk.

Evidence-Based Suicide Prevention Programs for Medical Settings and Schools

There are several evidence-based treatments that have been touchstones for treating adult individuals at risk for suicide. Cognitive behavior therapy intervention for those attempting suicide was shown to reduce reattempts by 50% over an 18-month period when compared with treatment as usual.58 Dialectical behavior therapy intervention reduced suicide attempts by 50% over 24 months, compared with community treatment.59 More recently, in a landmark Emergency Department Safety Assessment and Follow-up Evaluation study in adults, it was demonstrated that universal suicide risk screening paired with a simple, brief intervention of safety planning and postdischarge telephone check-ins was shown to decrease suicide attempts by 30% over 12 months.60 Several suicide prevention programs are available to intervene with youth at risk for suicide in the medical setting. The Family-Based Crisis Intervention61 was created in a pediatric ED to stabilize a suicidal adolescent within a single ED visit, with adaptations for primary care currently in progress. The Family Intervention for Suicide Prevention62 intervenes with teens who present to

FIGURE 1
The ASQ tool was developed through a multisite study led by the National Institute of Mental Health. The Ask Suicide-Screening Questions (ASQ) Toolkit. Available at: https://www.nimh.nih.gov/ASQ. Accessed October 15, 2019.
the ED with suicidal ideation or after a suicide attempt. This and similar prevention programs have been adapted for other medical, school, and community settings.\textsuperscript{63} Pediatricians should also be aware of and partner with school systems that have begun to use effective school-based interventions (eg, Signs of Suicide\textsuperscript{64,65} and Sources of Strength\textsuperscript{66}).

Pediatricians have a renewed interest in collaborative care models of integrated mental health care within primary care settings. Currently, mental health care is not well integrated into primary care, but creative solutions are being developed to provide increased resources to those with more complex conditions. Telehealth is also an emerging method of managing mental health problems in areas where there are limited or no mental health resources.

**Safety Planning and Lethal Means Safety Counseling**

Before discharging a patient that screens positive for suicide risk, the pediatrician, patient, and parent or guardian (if available) should create an individualized safety plan and review which lethal means are available to determine how to safely store or remove them from the home.\textsuperscript{67} Firearms are the leading and most lethal method of suicide death in youth 10 to 24 years of age in the United States (46% of all suicide deaths), followed by suffocation or hanging (38%) and poisoning or overdose (7%).\textsuperscript{3} Educating families about the importance of keeping firearms and medications locked away from their child’s access is critical and could be life-saving.\textsuperscript{67,68}

Pediatricians should not ask patients to sign “safety contracts” to “promise” not to hurt themselves because these are not valid.\textsuperscript{69} Rather, pediatricians and patients together should create concrete, personalized safety plans (eg, “What will you do when you are having thoughts of suicide? Who will you tell? How will you cope?”). Safety planning\textsuperscript{70} includes developing coping strategies for times of crisis; recognizing one’s own warning signs; identifying family members, peers, or professionals who can be contacted for help; and providing contact information for the National Suicide Lifeline (1-800-273-8255) and the Crisis Text Line (text “start” to 741741).

**Scaling Up Implementation of Suicide Risk Screening With Quality Improvement Projects**

Turning suicide prevention research into real-world implementations is challenging but has been done successfully. In general, screening programs need to be flexible so that each institution can adopt validated tools and adapt processes to fit harmoniously within the workflows and culture of each site and the populations it serves. Screening programs are best implemented within a quality improvement “Plan-Do-Study-Act” iterative model,\textsuperscript{70} beginning with training and education of all involved, followed by a brief pilot screening phase. A few weeks after initial implementation, stakeholder feedback should be used to revise the screening program as necessary. Using a continuous improvement model that is able to incorporate advances in research, improve tools over time, and make revisions to the screening program is important. Parkland Health and Hospital Systems in Dallas, Texas, serve as a universal suicide risk screening model program for the country; it has screened >2 million adult and pediatric patients for suicide risk without major disruptions to their inpatient and outpatient hospital workflows.\textsuperscript{71} They began with a pilot phase and adjusted as needed on the basis of feedback from patients, families, staff, and physicians.

Another example of a screening quality improvement project took place in a large pediatric practice in Richmond, Virginia, which implemented the ASQ among pediatric medical outpatients seen for routine physicals.\textsuperscript{72} All staff, including physicians, nurses, nurse practitioners, and front desk staff, attended trainings on suicide risk detection and prevention. An example of a revision to the program, after the pilot phase of screening all well visits for patients 12 years of age and older, was responding to parent concerns about asking children about suicide. Parents of the pediatric patients had more questions about the screening than anticipated, so the process was revised to include a flyer given out preemptively to parents during front desk registration. The flyer announced the new addition of suicide risk screening to standard practice, the reasons for universal screening, and referenced several research articles about the safety of screening young people for suicide risk. After the staff became more comfortable screening, they expanded the pilot to include all patient visits, sick or well, for patients 10 years of age and older. The iterative, “Plan-Do-Study-Act” process helped the pediatric practice gradually incorporate changes to their program informed by their own patient data. Through this participatory, experiential, monitoring, and results-oriented progression, staff are now comfortable with screening. They have created a highly functioning and potentially life-saving screening program that the practice, patients, and their families value.

Lessons learned from implementations teach us that overresponding to positive screen results can make screening programs untenable. It is unnecessary and burdensome to patients and staff to reflexively treat every patient who screens positive as an “emergency” (eg, a trip to the ED, automatic
one-to-one observer, and/or a full psychiatric evaluation). Each positive screen should be followed by a BSSA in which next steps can be determined for feasible and rational patient safety.

Challenges to implementing screening programs in medical settings include time constraints, managing patients who screen positive, discomfort with asking questions about suicide, and stigma.29,73 Pediatricians have concerns about adding to their already overburdened systems of referring for mental health care. Although accessing mental health care is a public health problem nationwide, data from large screening programs reveal that screening medical patients for suicide risk has not added volume to the ED boarding crisis or overburdened systems of care.74,75 Sadly, youth are struggling with suicidal thoughts whether pediatricians screen them. For most young people, screening itself can be an intervention because this could be the first encounter in which they are verbalizing their troubling thoughts to a trusted adult. In addition, much of the time a parent is unaware that their child is thinking about suicide.10 Uncovering suicidal thoughts can put the parent or guardian on notice to be vigilant for signs of imminent risk.

Current Gaps and Future Directions

In future research, investigators should determine frequency of screening, effectiveness of pediatrician-versus self-administered versions of screening tools, and mechanisms to leverage social media to mitigate suicide risk. Studies that include particularly vulnerable populations (eg, lesbian, gay, bisexual, transgender, and queer or questioning youth; neurodevelopmentally disabled youth; racial and ethnic minorities) may inform more-effective suicide prevention strategies.

Emerging research uses technology to help detect and prevent suicidal behaviors. New research has identified implicit association tasks as helpful in identifying patients’ implicit beliefs about suicidality.76 In recent studies, it has been suggested that a computerized adaptive testing approach to screening may be able to capture a more-complete spectrum of suicidality.77 Ecological momentary assessment research has started to use smartphones to track unique warning signs in real time that may precede or predict suicidal ideation and behavior.78

CONCLUSIONS

Pediatricians are on the frontlines of this critical public health crisis of youth suicide. Universal screening is no longer theoretical; medical settings throughout the country are pioneering ways to successfully identify and manage suicide risk. With evidence-based guidelines in place to manage patients who screen positive, suicide risk screening paired with interventions is feasible and potentially life-saving. Every pediatrician can make a difference and move us closer to the goal of reducing youth suicide.

ABBREVIATIONS

ASQ: Ask Suicide-Screening Questions
BSSA: brief suicide safety assessment
ED: emergency department
TJC: The Joint Commission

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