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Implementing Universal Suicide Risk Screening in a Pediatric Hospital

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Background: Health care providers are in a prime position to identify teens at risk for suicide, yet many do not. The research team developed and implemented a hospitalwide program to identify teens at elevated risk for suicide and connect them with services.

Methods: Screening was implemented at both locations of a pediatric hospital, including two emergency departments, three urgent care clinics, and ambulatory clinics. Patients aged 12 years and older presenting for care were screened for suicide risk using the Ask Suicide-Screening Questions (ASQ) in most settings, while the Columbia–Suicide Severity Rating Scale (C-SSRS) was used in mental health areas. A social worker responded to positive screens to complete a more thorough assessment and determine next steps. Social workers also completed outreach to patients in the weeks following a positive screen. Implementation began with pilot locations and expanded after refinements were made. Stakeholders provided screening recommendations, and education was provided prior to implementation. The cost of implementation was calculated based on the time screening required from nursing and social work.

Results: Review of the program focused on implementation fidelity, quality improvement, and trends among screening results. During the first year of screening, 138,598 screens were completed, and 6.8% of screens were positive for elevated risk. The annualized cost of the program was estimated to be $887,708.65 for personnel directly involved in screening and following up on positive screens.

Conclusion: Early involvement of stakeholders and hospital leaders and a robust response plan were essential to successful implementation of this suicide-screening program.

The 2019 Youth Risk Behavior Survey revealed that 17.2% of high school students surveyed in the United States had seriously considered suicide in the past year, and nearly half of those students (7.4%) reported making a suicide attempt.[1] Rates of suicide in this age group are on the rise, climbing 76% between 2007 and 2017.[2] Suicide is now the second leading cause of death for Americans between the ages of 10 and 24 years, with 6,807 youth deaths in the United States attributed to suicide in 2018.[3]

The Joint Commission's National Patient Safety Goal (NPSG) NPSG.15.01.01 calls for patients to be assessed for risk of suicide but only requires assessment of patients who are being evaluated or treated for behavioral health conditions as their primary reason for care; universal screening of all patients is not required.[4] The US Preventive Services Task Force recommendations also do not encourage universal screening.[5] This is unfortunate, as the vast majority of youth who die by suicide are not in behavioral health care treatment when they die. Thus, a system that focuses only on youth who have already been identified as in need of behavioral health care is likely to miss many who would benefit from early intervention.[6,7]

Health care providers are in a unique position to identify youth at elevated risk. Most individuals who die by suicide have recently seen a health care provider.[8] However, these individuals usually do not visit a health care provider because of their suicidal thoughts, and most clinicians do not routinely screen teenagers for suicidal thoughts.[9] Many barriers exist to screening for suicide risk. Resources in mental health are limited, and even patients who are identified as needing mental health treatment often struggle to access it. Clinicians may harbor worries that identifying more patients at risk could lead to additional patients boarding in emergency departments (EDs) as they wait for care. Stigma is also a barrier, and addressing suicide risk may not feel acceptable to everyone in the health care setting. Thus, many challenges exist for health care providers who seek to improve identification of teens experiencing suicidal thoughts.

Our health system decided to explore ways to identify and help teens who are at elevated risk for suicide. Although universal screening has been reported on previously,[10] our process uniquely identifies implementation in a children's hospital setting. Clinical pathways that provide guidance on best practices with suicide screening for youth were published in 2019.[11] Our project provides additional insights

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as to how implementation of suicide screening can be accomplished in a pediatric hospital. This article describes the five-year multidisciplinary process that led to an innovative program to screen all teens for suicide risk and provide follow-up services for those identified as at elevated risk for suicide.

METHODS

The SQUIRE 2.0 reporting guidelines were followed in reporting this intervention.[12]

Setting

Children's Mercy Kansas City is a freestanding, nonprofit, 366-bed academic pediatric health system located in Kansas City, Missouri, that provides comprehensive primary and tertiary specialty care to children (including patients up to the age of 21) from a 189-county region in Missouri and Kansas. It offers the only Level 1 pediatric trauma center and the only Level IV neonatal ICU (NICU) between St. Louis and Denver. Comprehensive care is provided in 40 specialty areas.

Ethical Considerations

The service improvement project reported here was initiated to ensure compliance with Joint Commission guidelines on suicide prevention. The activities and reporting were determined to be "not human subjects research" by the Children's Mercy Hospital Institutional Review Board.

Intervention and Intervention Team

Our initiative began with a small focused group led by a child psychiatrist, a psychiatric nurse, and a member of our regulatory readiness team. We were first tasked with ensuring our compliance with Joint Commission guidelines on suicide prevention. Meetings with our Family Advisory Board and our Teen Advisory Board provided input from those we serve. We began with a pilot screening program in three clinics—diabetes, urgent care, and sports medicine. Each had different reasons for participating. The Diabetes Clinic had an embedded social worker and served a patient population that often struggles with depression and anxiety. Leaders in one location of the Urgent Care Center were seeing more and more patients who were expressing suicidal ideation and were prepared to move forward in identifying risk. The Sports Medicine Division had recently cared for two patients who died by suicide. We soon added our Teen Clinic because it cares for many patients who are known to be at elevated risk for suicide. Important lessons were learned from these pilot screening projects. For example, early on we had attempted to use the Columbia–Suicide Severity Rating Scale (C-SSRS) in the Teen Clinic. We found that so many patients had experienced thoughts of suicide in their lifetimes that the clinic did not have the bandwidth to respond to all positive screens, and we had to stop screening and regroup. This led to adoption of the Ask Suicide-Screening Questions (ASQ) in the parts of our hospital where non–mental health clinicians would be doing the screening, with the screen focused on the last two weeks and any prior suicide attempts. Another big concern was time. As we were developing this program, the hospital was working hard to decrease wait times. Screening would add precious minutes to wait times, and staff expressed concerns about this. Hospital leadership clarified that clinics would not be administratively punished if screening added to time in service. We also learned that clinicians worried there would not be an appropriate response to patients who screened positive. A swift response to positive screens in our pilot sites reassured staff that these fears were unwarranted. It also helped that few patients required 1:1 supervision or psychiatric hospitalization. Our education and communication plans for staff emphasized these results from the pilots to alleviate concerns that screening would lead to an abundance of patients needing inpatient care. Clinicians were often surprised when patients were identified as being at elevated risk for suicide. This confirmed our belief that a suicide screening program needed to be universal rather than focusing only on patients who were already deemed "high risk." Finally, we learned it was critical to have representatives from all disciplines participate in the implementation. Physicians, nurses, and social workers all had leaders from within their disciplines help to communicate the importance of the program. At times this communication was critical to moving the process forward, and when screening stalled in a certain area, representatives from the core implementation team reached out to leaders in that area to troubleshoot barriers.

Based on those lessons, we recommended to hospital leadership that we should implement universal screening for all patients aged 12 years and older who sought care in our system. Although we may eventually lower the age for screening, we believed that starting with 12 and older would be a manageable first step. The hospital chief operating officer (COO) approved the plan. Two leaders from social work and nursing were chosen to lead implementation efforts.

To gain buy-in from the many stakeholders whose support would be essential, the COO created a psychosocial screening task force (PSTF). The PSTF included stakeholders and content experts from nursing, pediatrics, psychiatry/psychology, bioethics, social work, informatics, and health services and outcomes research. The 30-member PSTF met monthly and was cochaired by a physician and a social worker.

The PSTF reviewed data from the pilot projects, identified content experts, and conducted a systematic review of the literature. Based on this work, the PSTF decided which patients should be screened, how often, and with which screening instrument. The task force also recommended who should administer the screening questions

and how to collect, report, and analyze the results and outcomes.

Our staff surveyed adolescents and parents regarding suicide screening. The majority believed that screening was important and should be done.[13] A small percentage of parents expressed concerns that the screening questions would lead to increased suicidal ideation and attempts. Some had general questions about what would happen with a positive screen. In response, we developed a pamphlet to help introduce the screening to families. The pamphlet described the rationale for our screening program and included reassurance, based on prior studies, that screening did not stimulate suicidal thoughts in teens.[14]

Screening for suicide risk required a culture shift for the clinical staff, as we are a general medical hospital and do not have a psychiatric unit. Clinical staff generally did not have sufficient training in mental health issues or in screening patients for suicidal thoughts.[15] Most had never administered a suicide screening questionnaire before, so we developed scripts for staff to follow to increase their comfort in approaching patients and families. When we encountered parents who did not want to be separated from their teens during screening, we explained the research that showed the need for confidentiality.[16]

We reviewed eight different screening instruments and eventually chose the ASQ.[17–24] The only exception was for patients in mental health clinics, where the C-SSRS[17] (screening questions) was already the standard. The task force eventually decided on the following approach:

- The ASQ is the screening instrument for all medical patients. Mental health clinics continue to use the semistructured C-SSRS interview.
- The screening is administered verbally.
- All patients aged 12 years and older are screened unless it is deemed to be clinically inappropriate (for example, nonverbal patients, those in extreme pain).
- For non-English-speaking patients the health care provider asks the questions, and they are interpreted by a live or phone interpreter.
- Social workers respond to positive screens to further assess patients. Social workers connect patients with mental health resources, develop safety plans that include means restriction education, and coordinate follow-up care.
- For patients with a prior suicide attempt, a preface is added to question 4 on the ASQ: "Since [date of last documented suicide attempt], have you tried to kill yourself?"
- Suicide precautions (1:1 observation) are initiated only for patients deemed to be at acute risk of suicide. This includes patients who respond "yes" to question 5, "Are you having thoughts of killing yourself right now?"
- Screens are completed monthly in the ambulatory setting, weekly on inpatient, and at every visit in the EDs and all mental health clinics. This timing reflected discussion with experts in the field of suicide risk assessment, with our staff, Parent Advisory Board, and Teen Advisory Board.
- If a patient refuses to answer the screening questions, this is treated as a positive screen and the patient is seen by social work. When caregivers refuse screening, staff provide education for these families regarding our intent but allow the family to opt out.

The recommendations made by the task force were approved by the Medical Staff Executive Committee.

Addressing the Educational Needs of Staff

We realized that, before implementing a hospitalwide screening process, we needed to educate the hospital staff and the social workers who would respond to patients with positive screens. We formed an education work group that recommended two online educational modules. One was for all screeners, leaders, and clinical staff. This module explained why we were screening for suicide risk, the scope of the problem, the screening instrument and process, how to incorporate screening into patient workflow, and guidance on how to handle screening results. A second was a shorter educational module for nonclinical staff. This module explained why we were screening and gave information about available resources for staff.

In the first year of implementation, more than 2,500 employees out of 5,492 completed the suicide screening curriculum. Supplemental live training sessions provided opportunities for additional questions and discussion, led by a psychiatrist, nurse, social worker, and clinical informatics specialist.

The social workers who were tasked with responding to positive screens needed more comprehensive education about suicide risk assessment. The goal of this education intervention was to ensure that all social workers could effectively and efficiently assess a patient for suicide risk, conduct thorough safety planning with an emphasis on means restriction, and make recommendations for a safe discharge. Social workers attended a team-based live training session that covered these topics.

Formal education was supplemented by additional offerings to reach staff at multiple levels to initiate a culture change in how our hospital addresses suicide risk. The reasons behind implementation were presented at several meetings for leaders, highlighting de-identified cases from within our own institution. One such example, from the time before implementation of screening, was of an adolescent female who had been treated in multiple clinics within our system in the weeks prior to presenting to our ED after an intentional ingestion. Such cases illustrated the missed opportunities to prevent suicide attempts and built institutional support for a screening program. A prominent suicide prevention expert provided Grand Rounds on the value

of suicide screening and emphasized that universal screening is a feasible goal.

Early in the implementation process, an internal communication plan was developed. The plan focused on the prevalence of teen suicide and the reasons our approach was universal rather than targeted. Nursing and physician leaders were given detailed information regarding implementation dates and tasks, including completion of the educational module and ordering of brochures and fliers that had been created regarding the suicide screening process. Representatives from each professional group (for example physicians, nursing, social work) reached out to leaders of their own groups to garner support for the screening initiative. In this way, all clinicians were educated about the process by their peers.

A multidisciplinary work group was formed to guide implementation. A literature review provided some guidance on what to expect with regard to rates of positive screens. One study in pediatric EDs[18] found that 4.1% of ED patients presenting with medical/surgical chief complaints screened positive for elevated risk, but no guidance was available in the literature with regard to what to expect in our specialty clinics. Given this, the team extrapolated from our pilot locations, with an estimated positive rate of 3.5%. It is important to note that the Sports Medicine Division was overly represented in the pilots, as they were early adopters of screening. The work group evaluated patient volumes by location and projected volumes of eligible patients for screening and positive screens. To avoid sudden high workloads for our informatics and social work staff, high-volume areas were scheduled to go live independently, with lower-volume areas grouped by specialty or location. As feedback was received from leaders, each area was assigned an implementation week, and a time line was developed. Implementation began on October 1, 2018, and was complete by January 21, 2019.

Assessment Plan and Measures

The screening questions were built into our electronic health record (EHR). Staff verbally ask the screening questions and document a yes/no response in the EHR. Screens are categorized as negative, positive, historical positive, or not complete. Historical positives are tracked on our report with the ASQ, but not for those screened in Developmental and Behavioral Health with the C-SSRS. An affirmative response to any question on the ASQ or the C-SSRS was considered a positive screen for reporting purposes. Screens are marked as not complete when the patient is not due for screening based on screening frequency criteria, the parent or patient refuses the screen, or the screener deems the patient to be ineligible due to clinical presentation. If a patient has an affirmative response on any question, social work is notified. If acute risk is identified, the patient is placed on 1:1 observation. Mental health professionals complete their own suicide risk assessments instead of contacting social work. Social work responds to positive screens to further assess patients using the C-SSRS. Social work staff stratify the level of risk of the patient, develop safety plans with a focus on means restriction, and identify the best disposition plan. The majority of the social worker's time on each evaluation is spent with the in-person evaluation, coordination with the medical team, identifying mental health resources, documentation, and completing follow-up phone calls. Social workers reach out to the caregiver the day after the initial assessment to reinforce the plan and assist with any barriers to seeking/receiving care. They also call weekly for the next four weeks to help mitigate barriers to seeking mental health treatment.

Evaluation Plan

We tracked the locations of screenings, number of patients screened out of patients eligible to be screened, and positivity rate by location. We present estimates of the costs of implementing suicide screening and follow-up. We did not track the costs of developing the educational or technical aspects of the program (for example, psychiatrist, clinical informatics staff) nor costs associated with behavioral health visits where suicide screening is done in all visits. The suicide screening data are shared with nursing, physician, social work, and implementation leaders monthly. The focus has shifted to quality improvement, with the goal of screening at least 95% of eligible patients each month. Although there had been early concerns that families would be uncomfortable with this process, we experienced appreciation from many parents who had not realized the struggles their adolescent was facing. Often when a patient discloses a history of suicide attempt or an aborted attempt, the parent is unaware. Many staff members have also expressed how rewarding it has been to assist with identifying youth at risk for suicide.

RESULTS

Locations of Screenings

At the start of 2018, screening was ongoing in pilot locations. These included Teen Clinic, one urgent care center, Eating Disorder Center, Diabetes Clinic, inpatient, and all sports medicine clinics. Additional locations were added throughout 2018. By February 2019 the final three locations (EDs, surgery clinics, and ophthalmology clinics) were brought online, and the entire hospital system was implementing screening.

Number of Patients Screened

During the first quarter of 2018 we screened a total of 4,180 patients. In 2019 we conducted 138,598 screens. Figure 1 displays the number of eligible patients and completed screens by month in 2019.

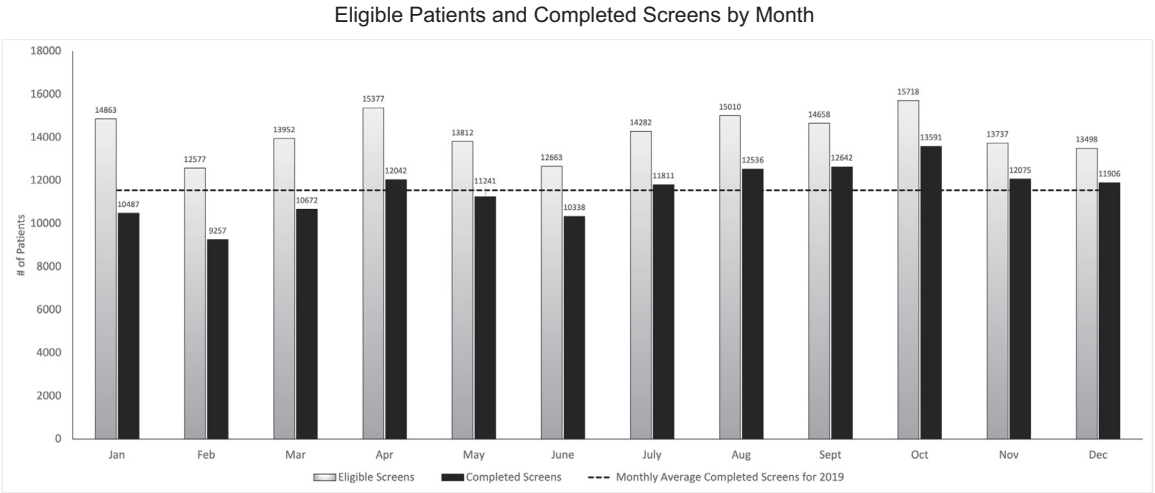

Figure 1: Shown in this figure is the monthly number of eligible and completed suicide risk screens for 2019. The dashed line shows the 2019 monthly average of eligible screens.

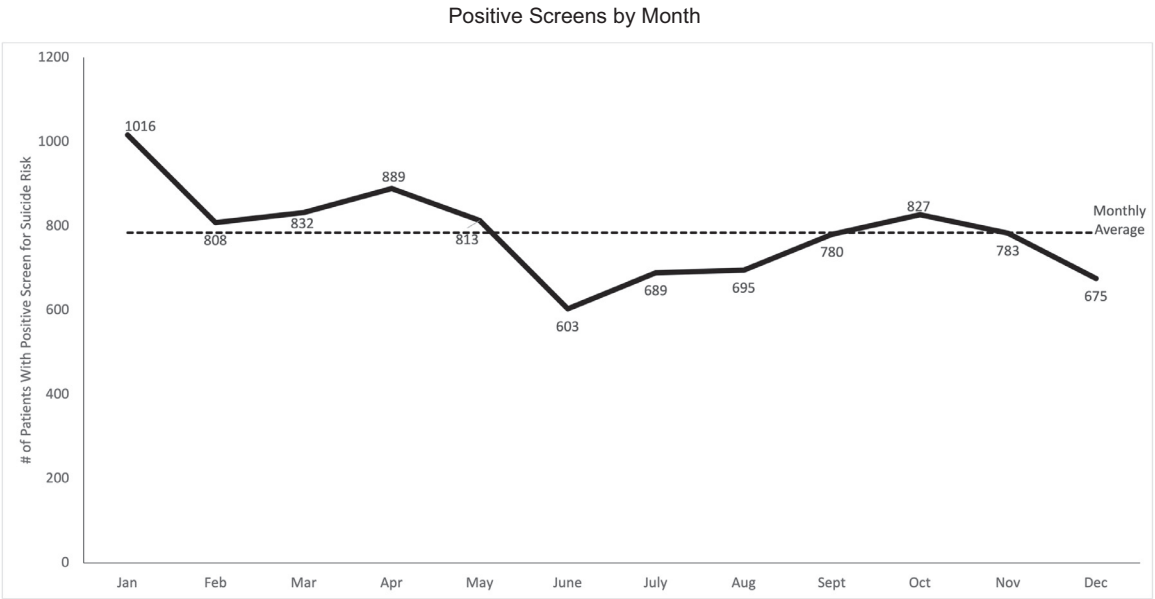

Figure 2: Shown in the figure is the number of completed screens each month identified as positive for elevated suicide risk. The dashed line shows the 2019 monthly average number of positive screens.

Positivity Rate

For the first quarter of 2018 we observed a positivity rate of 4.3% (181/4,180). This increased to 5.0% in the second quarter (194/3,910) and 5.7% in the third quarter (249/4,349). Finally, in the fourth quarter, when most sites were added, the rate rose to 8.8% (1,436/16,282). During 2019 the positivity rate was 6.8% (9,410/138,598), much higher than the 3.5% we had projected based on prior literature and our pilot studies. The number of positive screens by month in 2019 is displayed in Figure 2. Due to the modifications to question 4 of the ASQ, we correctly anticipated that the positivity rate would decrease slightly over the first several months of screening, as historical suicide attempts were no longer recorded as positive screens. Between January and June 2019 the number of historical positives increased by 90.0%. During the same time frame, the monthly positivity rate decreased from 9.8% in January to 5.8% in June. We also saw that rates of positive screens dipped in the summer. This is consistent with prior studies of seasonal variation in suicide rates.[25]

Positivity Rate by Location

The highest number of positive screens came from the ambulatory clinics(46.8%), followed by the EDs (26.7%), Developmental and Behavioral Health Clinics (12.3%), urgent care centers (8.5%), and inpatient units (5.8%) (Figure 3).

Table 1. Cost of Suicide Screening Implementation

Staff	Number of Encounters	Time Spent per Encounter	Total Time Spent on Assessments	FTE	Benchmark Salary	Total Cost per Year
Nursing	138,598 screens	1 minute	2,309.96 hours	1.11	$64,147	$71,203.17
Social Work	9,410 assessments	2.8 hours	26,348 hours	12.67	$64,444	$816,505.48

FTE, full-time equivalent.

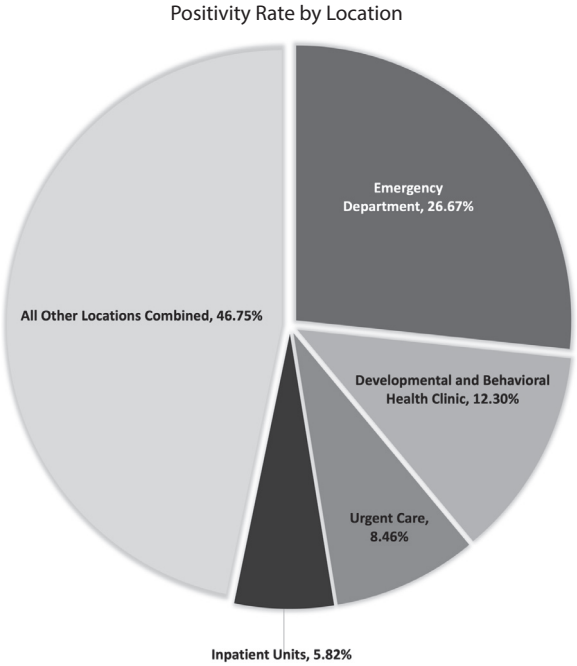

Figure 3: Shown in the figure is the percentage of total positive screens for 2019 attributable to the emergency departments, Developmental and Behavioral Health Clinics, urgent care centers, inpatient units, and Ambulatory Clinics.

Cost of Implementing Suicide Screening and Follow-Up

Table 1 outlines the number of encounters completed in 2019 and the associated costs. These numbers reflect the start-up costs and the higher rates of positive screens when screening begins, as historical suicide attempts are identified for the first time. The primary cost of the program is the cost of the social workers' and nurses' time to complete follow-up on positive screens. We were not able to hire additional staff specifically for the suicide screening or follow-up program. Instead, nursing staff added the 1-minute screening to their standard vitals assessment, or it fit into another part of their workflow. Social work also did not hire additional staff but absorbed the additional work with their existing staff.

DISCUSSION

The implementation of universal screening for suicide risk was a large undertaking that required the commitment of considerable institutional resources. In the first year, we identified many youth at risk for suicide who have received care. We found that the overall rate of patients with positive suicide screens was higher than we had projected at the outset. Our projections were based on published rates with ED patients[18] and from our pilot sites. Sports medicine patients were overrepresented in our pilot sites, and we now see that these patients tend to have low rates of positive screens (< 2%), so our estimates in turn were low. We still do not know why our overall numbers are so high. However, rates of suicide among youth in the states we serve, Kansas and Missouri, are consistently higher than the national average.[26] A study published in 2019 had a rate of 4.5% among adolescents in an inpatient setting, but only 44% of patients were screened in that study.[27]

Our suicide screening program is not a research project. However, we recognized that suicide risk screening data could help researchers create generalizable knowledge. We therefore developed a de-identified data set of our screening results that uses an honest broker[28] model to ensure that individual patients cannot be identified. Researchers are able to request access to the de-identified data to explore research questions on suicide risk.

Our experience has taught us three key lessons. First, it is crucial to have early involvement of executive leadership and frontline staff, particularly those with no experience in mental health, in the planning process for such a program. Second, it is important to engage all segments of our health care system, from the administrative staff who help us ensure that we have the correct pamphlets on hand, to the physicians who may not themselves screen a patient but who can help to reinforce recommendations provided by social workers. Third, there must be well-developed plans for an immediate response to patients with elevated risk of suicide. Such a plan must include clinical assessment as well as safety planning that involves means restriction education and follow-up. We found that the costs of screening are relatively low; however, the costs of care coordination for those who screen positive are substantial. We were gratified to see that although there was some initial concern that families may object to screening, most expressed appreciation for these efforts.[13]

CONCLUSION

Our work thus far has taught us that early identification of many adolescents at elevated risk for suicide is possible

through screening. We are now looking at ways to maintain screening and to ensure that all patients are screened with the ideal approach and response every time. This takes constant education and reeducation, particularly as new staff onboard to our institution, and as we have had an increase in virtual visits.

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