

Substance Use Screening in a Large Pediatric Primary Care Network: A Quality Improvement Project

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Abstract:

Background: This project aimed to introduce substance use screening, using the CRAFFT (Car, Relax, Alone, Forget, Family/Friends, Trouble) screening tool, into the routine care of adolescents using quality improvement strategies and tools. **Methods:** We expanded a single-site project showing the successful introduction of CRAFFT screening into adolescent care to include the entire 34-site primary care network of a children's hospital in Northeastern Ohio. We deployed quality improvement methodology to facilitate the acceptance and use of the screener. Data showing the percentage of eligible adolescents screened were collected and shared monthly with network providers. **Results:** The single-site phase increased the screening rate from 3.5% to 72%. The percentage screened for the network phase rose from 0% to >90% in the first 2 months of the project and remained at that level. Of those screened, 85% were low risk, 3% were medium risk, and 2% were high risk. Ten percent of the results were not recorded in a way that allowed for post hoc risk assessment. During the network phase, 35,750 of 38,427 (93%) eligible patients completed the screening form. **Conclusions:** This project resulted in the highly reliable use of the CRAFFT screener in a large primary care network. (*Pediatr Qual Saf* 2024;9:e745; doi: 10.1097/pq9.000000000000745; Published online July 10, 2024.)

INTRODUCTION

Adolescent substance use and abuse are common problems with the potential for devastating consequences. Approximately 5000 adolescents aged 14–18 years died of unintentional drug overdose in the United States between 2010 and 2019, with an additional 2100 deaths in 2020 and 2021.¹

Monitoring the Future (MTF), a continuing study of American youth, found that overall substance use decreased in 2021 for

eighth, 10th, and 12th graders.² Some believe this decrease is related to COVID pandemic lockdown policies. On the other hand, marijuana use in young adults (19–30 years of age) has been at its highest level since 1975, according to MTF follow-up data.² The MTF 2021 survey found that 7.1% of eighth graders reported using marijuana in the past 30 days. This number increases to 10.1% for 10th graders, 19.5% for high school seniors, and 29% for young adults. The same MTF 2021 survey found the rate of alcohol usage in the last 30 days for eighth graders was 7.3%, 13.1% for 10th graders, 25.8% for 12th graders, and two-thirds of young adults.²

Alcohol and drug use are both associated with an increased likelihood of accidental death,¹ injury, high-risk sexual behaviors,³ and suicidal behavior.⁴ Motor vehicle accidents are the second leading cause of death among teens (age: 15–20 years) in the United States. In accidents where the driver was killed, 24% involved a driver who had been drinking alcohol.⁵ Similarly, underage binge drinkers were 30% less likely to use a condom during their last sexual intercourse than nondrinkers.⁶ Drug and alcohol use increases the likelihood of sexual assault for both victims and perpetrators.^{3,7–12} Lastly, the combination of depression and drinking increases the likelihood of fatal suicide attempts among teens.¹³ Regular marijuana use during adolescence increases the risk of developing psychosis, schizophrenia, anxiety, and depression in adulthood 2- to 5-fold.¹⁴ Adverse cognitive effects and lower school performance are associated with regular marijuana use.^{15–17}

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Screening for the use of alcohol, tobacco, and drugs has long been considered standard in the care of adolescents.^{18–23} The use of drug and alcohol screens is recommended by the AAP's Bright Futures Guidelines.²³ Examples of screening tools include HEEADSSS (Home and Environment, Education and Employment, Eating, Activities, Drugs, Sexuality, Suicide/depression, Safety),²⁰ and CRAFFT (Car, Relax, Alone, Forget, Family/Friends, Trouble). The CRAFFT screener is an evidence-based, accessible, and easy-to-use screening tool for primary care settings.^{19,21} The current version is CRAFFT 2.1 + N, which also screens for nicotine use and assesses the risk of substance use disorder (SUD). Using the evidence and learning of a single-practice CRAFFT Screening pilot, a large Northeastern Ohio network of primary care pediatric practices undertook a QI project in 2020 to standardize the use of the CRAFFT screen at all adolescent well visits.

METHODS

Improvement Timeline and Setting

This improvement project spanned 2 years and 6 months (January 2019–June 2021). In 2019, phase 1 represented project conception and planning with early testing. The intervention and measurement period for phase 1 went from January 2019 through June 2019. Central planning and EHR modifications occurred between June 2019 and the launch of Phase 2 in January 2020. Communication strategies to prepare the network for the project were deployed between January 2020 and March 2020. The intervention, measurement, and financial incentive period for Phase 2 went from May 2020 through December 2020. Phase 2 focused on spread across the primary care network. Phase 3 represents the sustainability monitoring phase from January 2021 through April 2021.

The work took place at a large, free-standing children's hospital primary care network of 34 primary care practices in urban, suburban, and rural locations, serving as the patient-centered medical home for over 80,000 adolescents. This fully used provider network comprised approximately 200 primary care pediatricians and nurse practitioners. All providers participated in the project. The project was conceived and executed as a quality improvement (QI) project. As such, it did not meet the institution's requirements for the institutional review board's consideration.

Improvement Structure and Methodology

A multi-disciplinary committee directs Primary Care QI and includes practice administrators, practicing providers, informaticists, and QI methodologists. This committee identifies improvement opportunities in alignment with organizational improvement priorities.

The QI methodology chosen to guide the improvement was the Model for Improvement.²⁴ The improvement team identified improvement aims and key drivers (Fig. 1).

Similarly, process mapping and failure modes effect analysis were performed. Interventions were explored with Plan/Do/Study/Act (PDSA) iterative testing, resulting in decisions to adapt, adopt, or abandon interventions.

Providers participating in the American Board of Pediatrics Maintenance of Certification program could obtain Part 4 credit for participation. Other incentives for providers included a financial bonus payment tied to quality performance.

Measurement

The primary improvement measure was the percentage of children aged 12 years and older who were seen for well child care with a CRAFFT screen completed and documented in the electronic health record (EHR). Chief Complaint (eg, 14 Year Well Child) was used to identify eligible visits. This measure was calculated monthly and communicated monthly at the practice and provider levels. Secondary measures including screen positivity and referral rates were also assessed. The demographic data were included in the analysis.

The specific aim was to increase the percentage of patients aged 12–21 years screened using the CRAFFT tool during their well-child visit in Primary Care from 0% to 80% between January 2020 and December 2020.

Interventions

The initial intervention was designed as a single-site pilot, intending that the knowledge gained would inform project feasibility and planned expansion. A hospital management trainee developed and executed the pilot for QI coursework. The pilot project identified the CRAFFT screener as the appropriate choice for the network. Issues associated with the practicality of a two-sided form were addressed, as were documentation challenges. The pilot ended with the completion of the trainee's coursework. Once the process was successfully established, preparation was made to roll it out to all offices in the network. This included a multimodal communication plan to address implementation, EHR enhancements, and provider educational needs. First, this project was identified as the key primary care QI project for 2020 and communicated to the network through targeted emails and educational sessions at general staff meetings and local practice staff meetings. Additionally, the informatics team built appropriate documentation tools in the EHR for providers and staff and included proper adolescent privacy features. To help providers with scoring and interpretation, clinical decision support was developed in the EHR to identify a patient's risk level and recommend a referral to Addiction Services when appropriate (Fig. 2). The offices then had the opportunity to do their PDSAs to adapt the process to their circumstances. The CRAFFT screen was presented to patients as a form with a depression screening on one side (an already fully implemented screening tool and process) and the CRAFFT on the other side. We modified clinical staff

CRAFFT Screening Key Driver Diagram (KDD)

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Revision Date: 6/2/20

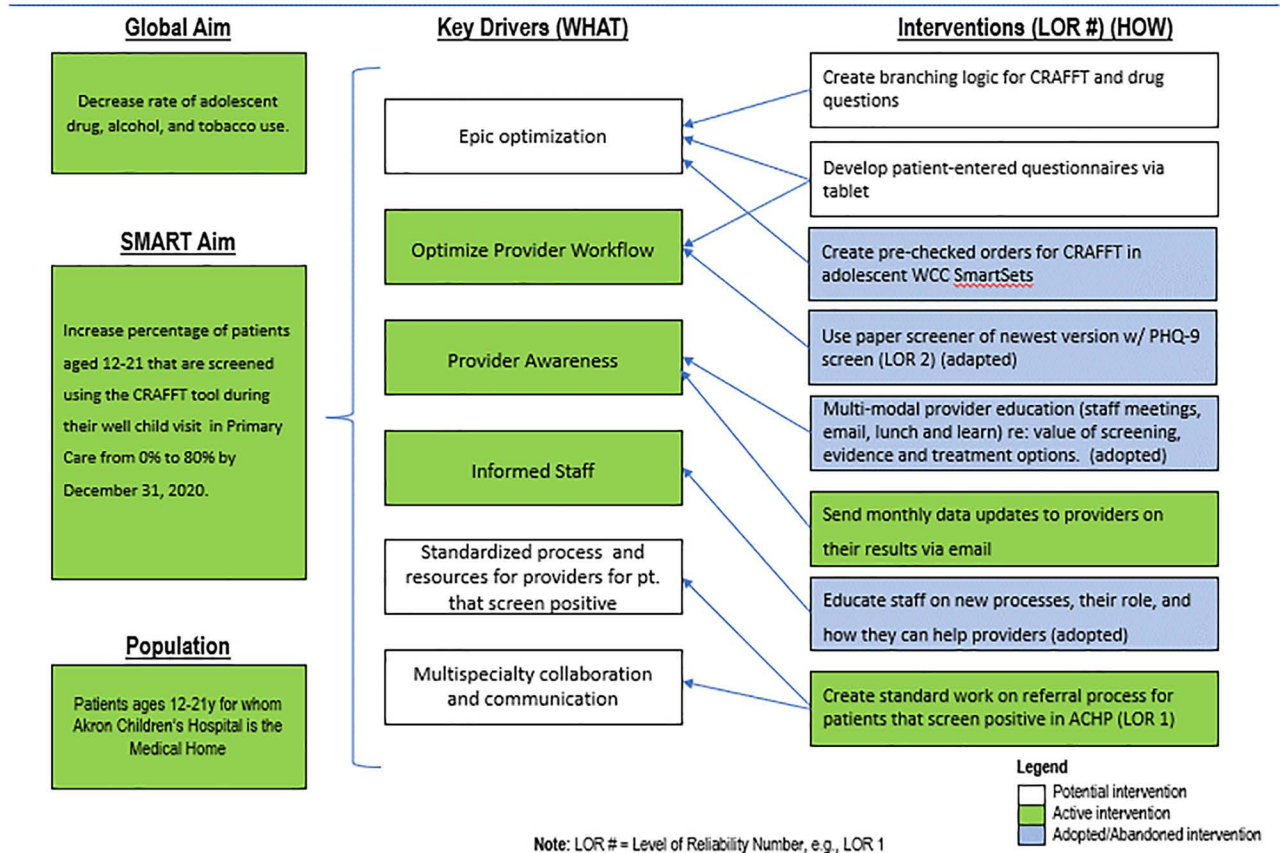


Fig. 1. Key Driver Diagram.

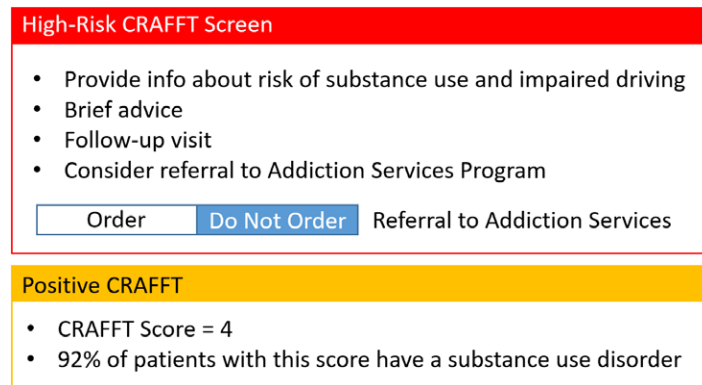


Fig. 2. EHR notification to provider of abnormal screening result.

workflow to include the CRAFFT form in previsit planning preparations for appropriate patients. All providers remained responsible for documenting and reviewing the results of the CRAFFT screen. Local interventions occurred at the practice or care team level and were shared among the primary care network. Local changes included documentation practices and enhancements in rooming procedures to encourage use and completion of forms. Educational interventions were conducted

with the providers throughout the year. Initial educational efforts included a review of the CRAFFT and evidence supporting its use. The use of SBIRT (Screening, Brief Intervention, Referral, Treatment) strategies was encouraged, as was motivational interviewing as an intervention for positive screens.²⁵ In parallel with this project, the hospital system launched a treatment program for the outpatient care of youth with SUDs.

Data Analysis

We collected and displayed data weekly (phase 1) and monthly (phase 2) in tabular format for providers and practices and as a run chart for the system, using EHR tools for data extraction and Microsoft Excel (Redmond, Wash.) software for display. The data included the number of patients eligible for screening (aged 12–21 years, well-child visits) and the number of patients screened to derive the percentage of patients screened rate. We used standard run and control chart rules to determine common versus special cause variation.

RESULTS

Phase 1

During phase 1 (January–June 2019) of a single-site (small-scale test) intervention, CRAFFT screening rates demonstrated a special cause variation with an increase from a baseline of 3.5% to a postintervention screening rate of 72% (Fig. 3). Annotations in the control chart denote the timing and nature of specific PDSAs. Demographic data were not evaluated at the single-site phase. There were 253 eligible visits during this period.

Phases 2 and 3

After planning to scale up the CRAFFT screening intervention, screening was deployed across all practices.

Measurement and results for Phases 2 and 3 were similar and are presented together. A total of 38,427 patients aged 12 years and older were seen for well care from May 1, 2020, through April 30, 2021, and considered eligible for screening. Of these, 35,750 (93%) had a result recorded in the EHR for the CRAFFT screen. Table 1 displays patient demographics.

The control chart (Fig. 4) reveals a rise from a baseline screening rate of <1% to > 90% in the first two months following the project’s initiation. The screening rate remained at 93.6% for the remainder of the study period.

Among screened patients, 85% demonstrated a low risk for SUD, 3% had a medium risk, and 2% had a high risk. Fifteen percent of high-risk patients were referred

Table 1. Demographics

Demographics (full panel May 1, 2020–April 30, 2021) Patients aged 12–21 years	
Race	31,010 White (80.7%) 5476 Black (14.3%) 1941 Other (5.1%)
Ethnicity	35,736 Non-Hispanic (93%) 1031 Hispanic (2.7%)
Insurance	14,102 Medicaid (36.7%) 23,814 Commercial (62%) 511 Self-Pay (1.3%)
Gender	18,804 Male (48.9%) 19,623 Female (51.1%)

% of Patients 12-21 Screened Using CRAFFT Screen During Well Child Visit at ACHP Barberton January 2018 - May 2019

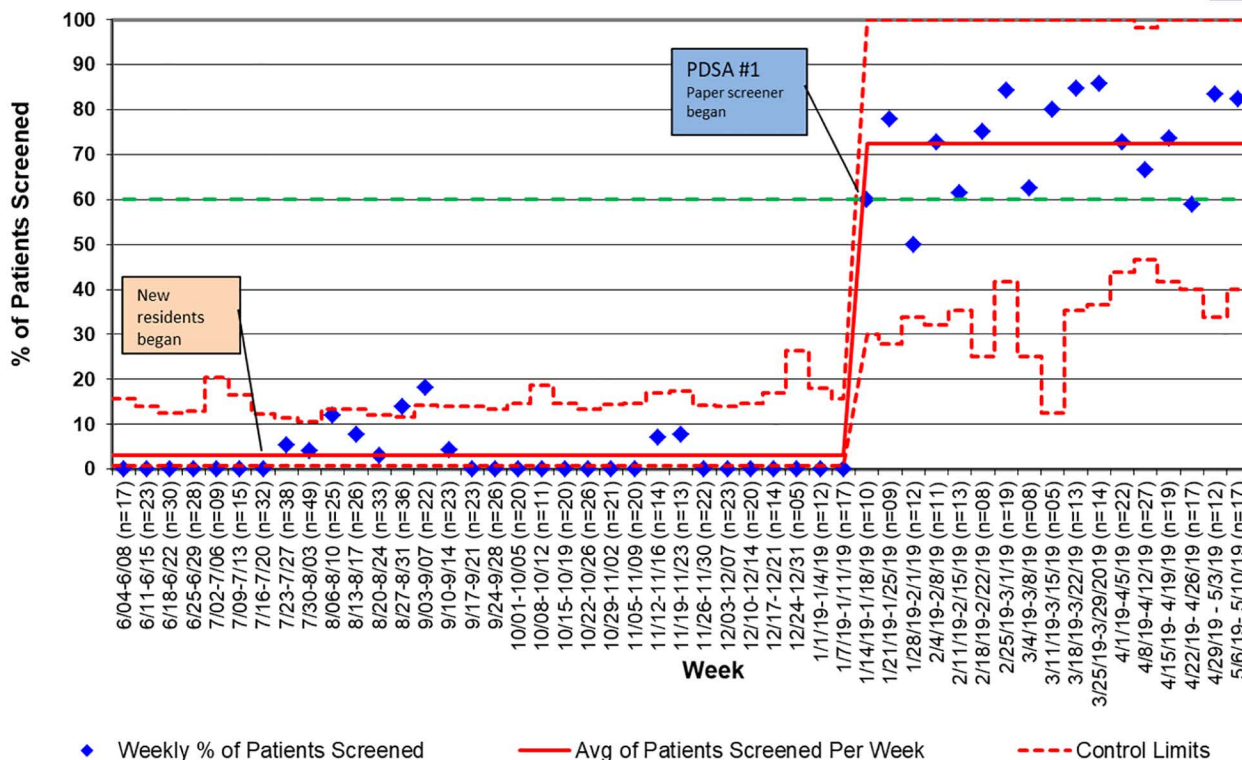


Fig. 3. Statistical process control P chart for the single site pilot project.

Percentage of Patients with a CRAFFT Screen at Adolescent Well Visits

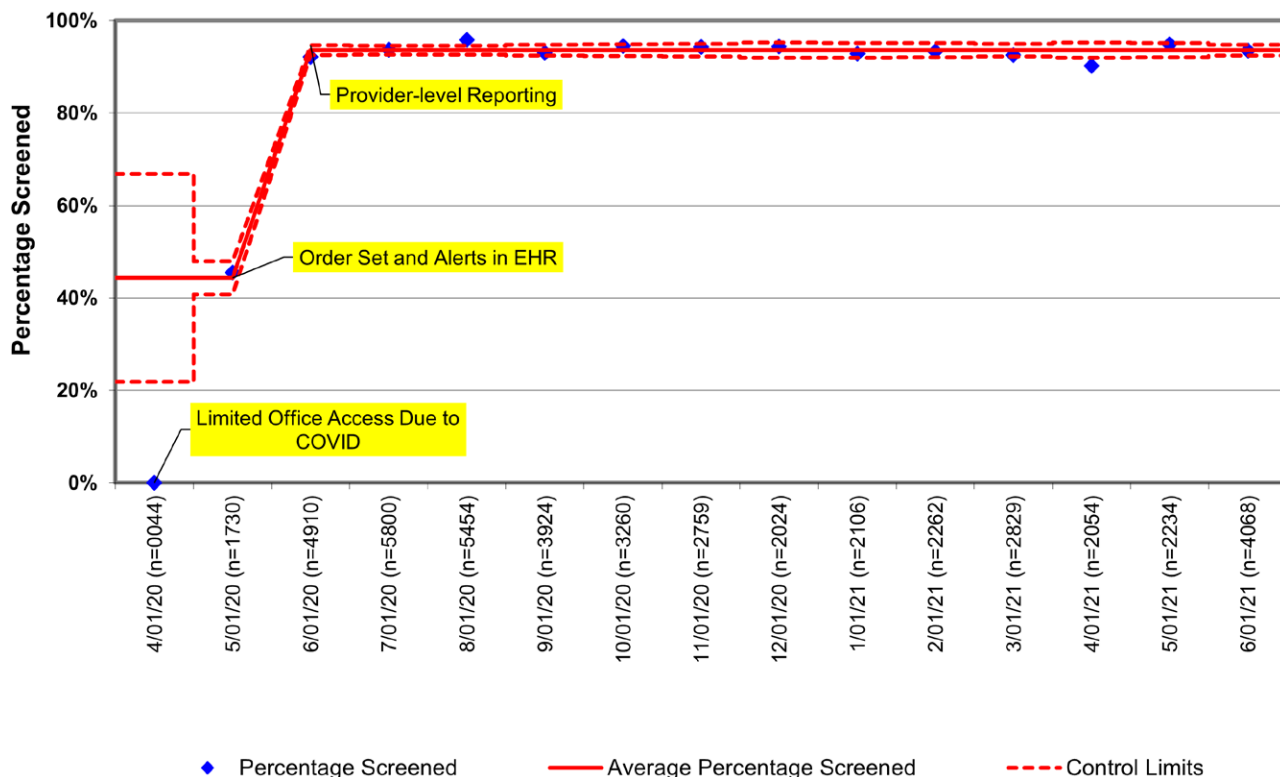


Fig. 4. Statistical process control P chart for the network.

to specialty care for SUD evaluation and treatment. Ten percent of the patients did not complete the full screening, and risk assessment was not possible.

Monthly CRAFFT screening rates in Phase 3 ranged from 90 to 96% (median 93.6%) for six months beyond the end of the large-scale QI priority period and the end of the financial incentive.

Of 213 providers, 206 had a screening rate above 80%, achieving the financial incentive goal, and 187 had a rate above 90%. All racial and ethnic groups were screened at rates above 90% (Table 1). The rate of screening for depression during the same measurement period using the PHQ-9 was 86%.

DISCUSSION

This project describes a roadmap for the successful introduction of a standardized screening process into an integrated primary care network. This path leverages central control and support, provider education regarding treatment and referral options, trusted QI tools, EMR tools, financial and other incentives, and regular data processing and presentation. This primary care network has done similar work in the past.^{26,27} Eversole demonstrated success using similar tools on a small scale in a single Adolescent Medicine clinic.²⁸ Harder et al²⁹ described the use of a learning collaborative composed of seventeen

nonintegrated practices in Vermont to increase depression screening in adolescents. Their project, using the same processes and population as substance use screening projects, has the additional strength provided by a control group of similar practices not participating in the project. A larger project by Hunt et al³⁰ described the introduction of substance use screening into various settings, including primary care, juvenile justice programs, community behavioral health programs, and schools. They screened over 140,000 adolescents between 2014 and 2019. One can reasonably conclude that the introduction of substance abuse screening can be accomplished in small or large settings and medical or nonmedical settings. Similarly, screening other populations (eg, pregnant women)³¹ or for other issues^{32,33} can be equally successful.

This project has limitations. As already noted, 10% of the results did not allow for risk assessment in this data extraction and review. This is most likely due to incomplete documentation by patients or staff. In addition, although we made every effort to provide adolescents with privacy and the assurance that it would be respected, there still may be under-reporting by adolescents of substance use and, thus, under-detection of substance use risks. Lastly, the improvement initiative began during the initial COVID-19 pandemic year when “normal” medical care was distorted worldwide. The pandemic brought

isolation and increased mental health concerns to a large portion of the adolescent population, creating an environment in which the results may have been different in any other year.

Most importantly, lacking in this project and much of the QI screening literature is evidence of benefit to the screened population. In this project, we describe the SUD risk level assigned based on screening and the referral of a small number of patients to a substance use specialty clinic. Neither gets to the heart of the question about whether screening with its associated strategies results in a reduction of substance use or a reduction in the development of SUD among our patients. Similarly, none of the studies cited previously provide any evidence of benefit to the screened populations. Indeed, evidence for the SBIRT approach with adolescents is relatively sparse. The most compelling study regarding substance use screening in the primary care setting, with 1700 patients, comes from Sterling et al, where they describe the long-term benefit of care provided by pediatricians randomized to one of two SBIRT arms compared with usual care.³⁴

The pediatric QI community must improve for the sake of the children and regions we serve and for pediatric providers. Built into projects such as this one should be some measure of benefit or lack of same. This is an enormous challenge. The issues of process versus outcome measures have vexed the QI community for years. This project, based solely on available EHR data, cannot determine the outcomes for most of our patients regarding substance use or development of SUD. Nor can this improvement effort offer any evidence regarding the effectiveness of the few minutes spent in discussion between patients and providers about substance use on the subsequent substance use behaviors of our patients. However, the data source of an EHR is enormous. With planning and foresight, the tools and information needed regarding benefit could be built. Levy and Weitzman, in a recently published editorial about SBIRT call for this strategy to fill some of the gaps in the evidence base for the efficacy of screening and brief intervention in the area of substance use.³⁵

The next steps could include using available data to track risk levels in individual patients who have been rescreened to assess factors related to rising or diminishing risk levels, providing one option to determine the effectiveness of screening and the associated care provided. In addition, evaluating barriers to specialty addiction treatment, providing more focused training of providers in SBIRT interventions, creating a robust support network including community and addiction services, increasing referrals to addiction care, and evaluating other opportunities to reach adolescents are all areas of potential activity. It will be important to go beyond the boundaries of the healthcare system. QI work should address questions important to the communities served and provide meaningful answers, including answers about those not touched by our efforts in the clinical setting. In the case of a substance use intervention, perhaps the measure of

importance is the high school graduation rate, or the rate at which drug overdoses present to the local ED. This argues for some role for school health programs and community partnerships in projects of this sort. Kemper et al describe what they are doing in their region to accomplish this type of work.³⁶

CONCLUSIONS

This project is an example of institutional QI work that is well done and quite effective at accomplishing the goal of bringing wide-spread substance use screening to this network of providers.

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