

Success Factors for and Barriers to Integration of Electronic Mental Health Screening in Primary Care

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Currently, only a third of primary care providers screen for substance use, which is a growing epidemic. This quality improvement study aimed to improve the screening process by integrating the Drug Abuse Screening Test without information systems support into the electronic health record to increase completed screenings and provider interventions for positive screenings in adult patients at an urban primary care clinic. Electronic drug abuse screening should include a prescreen followed by the Drug Abuse Screening Test, inter-professional approach, comprehensive education, and utilization of generic tools to create new screening forms. Staff participated in a new drug abuse screening process, and chart audits and staff interviews were conducted. There was a 9% increase in completed screenings by medical assistants with electronic versus paper screening (30% vs 21%, respectively; $P < .001$). There was a 33.4% increase in provider intervention for positive screenings with electronic versus paper screening (55% vs 21%, respectively; $P = .1081$). Primary care providers can play an increased role in drug abuse treatment by using available technology to overcome barriers to screening independent of information systems support. By adopting the new electronic screening documentation process, this clinic was able to increase its screening outcomes.

KEY WORDS: Drug abuse screening, Electronic health record, Primary care, Substance abuse

Substance use disorder is extremely underdetected and undertreated in primary care. At least 50% of primary care patients with substance use disorders stated that their primary care provider did nothing to address their substance use with less than one-third of providers actually screening for substance use.¹ If screenings cannot be done easily, and results and interpretations cannot be accessed quickly, primary care

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providers may not be able to incorporate screenings into clinical practice. Missed screenings can delay early recognition and intervention for patients with substance use problems. Substance use screening processes must be improved. Electronic health records (EHRs) can be used to integrate the 10-question Drug Abuse Screening Test (DAST-10) to identify patients with varying degrees of substance use-related problems who may need more intensive assessment and treatment.^{2,3} The EHR is a tool that can improve the screening process to increase completed screenings, early recognition, and appropriate interventions.^{3,4} The current DAST-10 screening documentation process at an urban primary care clinic is paper based. This quality improvement study aimed to incorporate electronic DAST-10 screening documentation, without information systems (IS) support, to increase DAST-10 completed screenings and provider interventions for positive screens in adult primary care patients. Identified success factors and barriers improved the electronic screening integration process.

BACKGROUND

Illicit drug use and the misuse of prescription medications are a growing epidemic affecting the lives of approximately 27 million Americans aged 12 years or older or about one in 10 Americans.⁵ In 2016, there were approximately 64 000 deaths attributed to drug overdose, which is a 21% increase in deaths from the previous year.⁶ The cost-benefit ratio of early identification and treatment for addiction ranges from 1:2 to 1:10, meaning that for every \$1 spent there is a \$2 to \$10 savings related to health, criminal justice, educational, and loss of productivity costs.⁷ Health effects of drug use include heart attack, stroke, HIV/AIDS, mental illness, and death.⁷

Individuals who abuse alcohol, pills, and/or illegal drugs often experience a delay of more than 10 years before seeking treatment.¹ Missed screenings can cause a delay in early provider identification and intervention, causing further health harm due to continued substance use. The 10-question DAST-10 is a screening tool that categorizes patients on a continuum from low to severe degree of drug abuse problem, excluding use of alcohol or tobacco, to identify patients who need more intensive assessment.⁸ Improvements in DAST-10 screening processes will allow for more

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efficient and effective screening methods to identify patients who may be at risk of problems related to drug abuse. A systematic screening process for substance use disorder should include a universal screening using a validated, single-question screening test followed by a more detailed, targeted assessment using the DAST-10 screening.³ Implementation of this screening process will allow for the integration of substance use disorder identification and treatment into the primary care setting.

A busy primary care clinic in an urban community was utilizing a paper-based DAST-10 screening documentation process despite access to an EHR. Providers reported difficulty in utilizing the paper forms, interpreting the raw scores, and tracking the interventions for positive screenings. If EHR access is readily available, it is essential to utilize it to enhance the screening processes. This allows the healthcare team easy access to patient health information, so that a comprehensive patient-centered treatment plan can be created. With access to an EHR, improvement in the DAST-10 screening process is a significant area for quality improvement.

LITERATURE REVIEW

The DAST-10 is a reliable and valid tool to screen for drug abuse in primary care.^{2,9} A positive screening had a sensitivity of 100% and specificity of 77% in determining current substance use disorder.⁹ A prescreening, consisting of a validated single-question screening test for drug use, allows identification of patients who and are not at risk for substance use disorder, after which the full DAST-10 would then be administered. Primary care patients are asked, “How many times in the past year have you used an illegal drug or used a prescription medication for nonmedical reasons?” An answer of at least one or more times was considered a positive screening and would necessitate the full DAST-10 screening.⁹ This single-question prescreen had a sensitivity of 100% and specificity of 73.5% in detecting current drug use disorder, which is comparable to that of the full DAST-10.⁹

Electronic screening integration of the DAST-10 and the single-question prescreen can increase identification and

treatment for patients with mental health disorders in primary care clinics.^{8,10} Elements of successful electronic screening integration are depicted in Figure 1. Increased screening rates can be achieved by adapting and revising the drug abuse screening and intervention process to fit within the existing clinic flow.^{11,12} Including prescreening instruments before full-screening assessments in the screening process saves time, as much as 2½ minutes, which would allow staff more time to complete other clinic responsibilities.¹⁰ In a primary care clinic that used an alcohol abuse prescreening tool, 30% of those screened had a positive prescreen, meaning 70% of patients did not need to complete a full screening after a negative prescreen.¹¹ In addition, utilizing an interprofessional team reduced the burden on the provider in favor of shared responsibilities for all clinical staff members.¹¹ Education of all members of the interprofessional team is an influential factor in successful electronic screening implementation, as insufficient training was noted to be a barrier to success.¹¹

The support of the IS department may be needed to create new screening forms in the EHR. However, this is not always possible, due to the lack of financial and human resources in IS-supported electronic integration of patient screenings.^{12,13} Greater system-wide high-level goals can outweigh the importance of creating and integrating new electronic mental health screening forms. In fact, creating new customized specialty electronic documents is labor-intensive and costly, with low utilization rates and adoption by providers.¹⁴ Instead, macro functions within generic notes should be used.¹⁵ It is possible to integrate the DAST-10 screening independent of IS support using generic functions within the EHR.¹⁴

THEORETICAL FRAMEWORK: SOCIOTECHNOLOGY

The sociotechnology theory is used in health informatics as a way to understand and alleviate poor utilization and performance of healthcare IS. This framework emphasizes the complex cultural and organizational aspects of the workplace and how these interactions affect technical systems.¹⁶ It further focuses on the interdependencies and goodness of

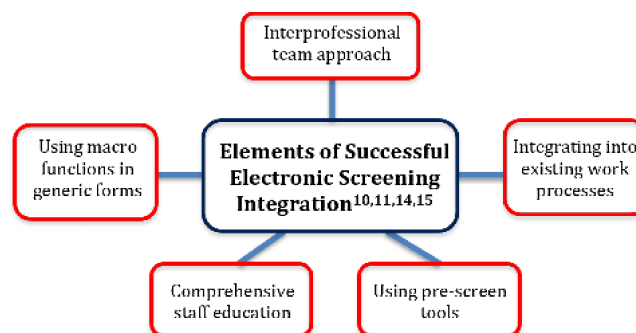


FIGURE 1. Elements of successful electronic screening integration.

fit between nonhuman and human systems.¹⁶ This theory was used to effectively merge the technical aspect of electronic screening and the social aspect of staff work processes to achieve higher screening and provider intervention rates. Current infrastructures were identified to seamlessly embed the new electronic screenings into existing work processes. For example, medical assistants (MAs) were already using the Auto Text tool within a clinical note to chart patient no-shows. This same tool was used to electronically document DAST-10 screening scores.

METHODS

Study Design and Sample

This study was a quality improvement project that used a technology-related solution involving an interprofessional team of family nurse practitioners (FNPs) and MAs to evaluate the use of electronic drug abuse screening. The primary objectives were to increase completed DAST-10 screenings and provider interventions for positive screenings. Staff members included three FNPs and four MAs at a primary care clinic in an urban underserved community. The institutional review board determined that this study did not meet the definition of human subjects research.

Before creating a new electronic DAST-10 screening process, the project leader shadowed the FNPs and MAs for 4 weeks to comprehend current workflow processes. This information was used to improve the integration of the electronic screening process into the established work routine. Medical assistants and FNPs were instructed on the new electronic screening process with increased FNP education on how to interpret DAST-10 scores and recommended interventions for positive screenings.

Figure 2 depicts the new electronic screening process. Only primary care patients who were 18 years or older and had not had any drug abuse screening within a year were eligible. Eligible patients received the single-question prescreen form in the waiting room; a positive answer required assessment using the full DAST-10 form. The MA would document the patient's responses in the EHR using the Cerner Auto Text tool (Cerner Corporation, North Kansas City, MO). Auto Text allows users to create a saved phrase as depicted in Figure 3, which is triggered by typing in the associated Auto Text abbreviation, to quickly input the saved phrase into a generic clinical note as depicted in Figure 4. The clinical note is then saved and becomes a part of the patient's permanent electronic medical record, which is then viewable in the EHR by the patient's clinical care team. Medical assistants entered the patient's raw score in the history portion of the patient intake form. The EHR automatically generated a date and time associated with data input. This allowed easy retrieval of when a patient was screened and the DAST-10 raw score. The project leader provided

continuous communication and support to staff members before and during the implementation process.

Measurement

Quantitative retrospective charts audits were performed on all patients seen by an FNP for the 8 weeks before the intervention, in which the drug abuse screening documentation was in paper format, and the 8 weeks after the intervention, in which the drug abuse screening documentation was in electronic format. Only primary care patients 18 years or older who had not had any drug abuse screening within a year were included in the chart audit. To evaluate the DAST-10 completed screening rates, preintervention and postintervention charts were reviewed. Both completed and missed DAST-10 screenings were measured. Completed screenings were defined as eligible patients who had a documented DAST-10 screening. Missed screenings were defined as eligible patients who did not receive screening. Drug abuse screenings completed within a year were not counted toward either the completed or missed screenings, as the patients were not eligible to receive the screening again.

To evaluate provider intervention for positive DAST-10 screenings, preintervention and postintervention were reviewed. Only charts that had a positive DAST-10 screening were evaluated for both provided and missed interventions. Any DAST-10 score of 1 or greater indicated a low to severe degree of problems related to drug abuse requiring further investigation, and was considered a positive screening. Any documented patient interventions, including motivational interviewing, counseling, or psychiatric referrals were considered a provider intervention. Fisher's exact test for statistical significance was used at $P < .05$ to compare the preintervention and postintervention rates for the two measured outcomes. Further data were collected on the DAST-10 screening results, including the DAST-10 positive and DAST-10 negative scores.

Qualitative staff interviews were conducted. Staff members were asked about their experiences with the new electronic screening process, including advantages and disadvantages, and whether they preferred the electronic DAST-10 screening process to the paper process. Themes from the staff interviews were compiled and evaluated.

RESULTS

All outcome measure results are represented in Table 1. The rate of DAST-10 completed screenings by MAs was higher with electronic screening versus paper screening (30.5% vs 21.5%, respectively). A total of 289 charts were reviewed for the preintervention evaluation, and a total of 371 charts were reviewed for the postintervention evaluation. This 9% increase in DAST-10 completed screening was statistically significant ($P < .001$). The percentage of charts reviewed in

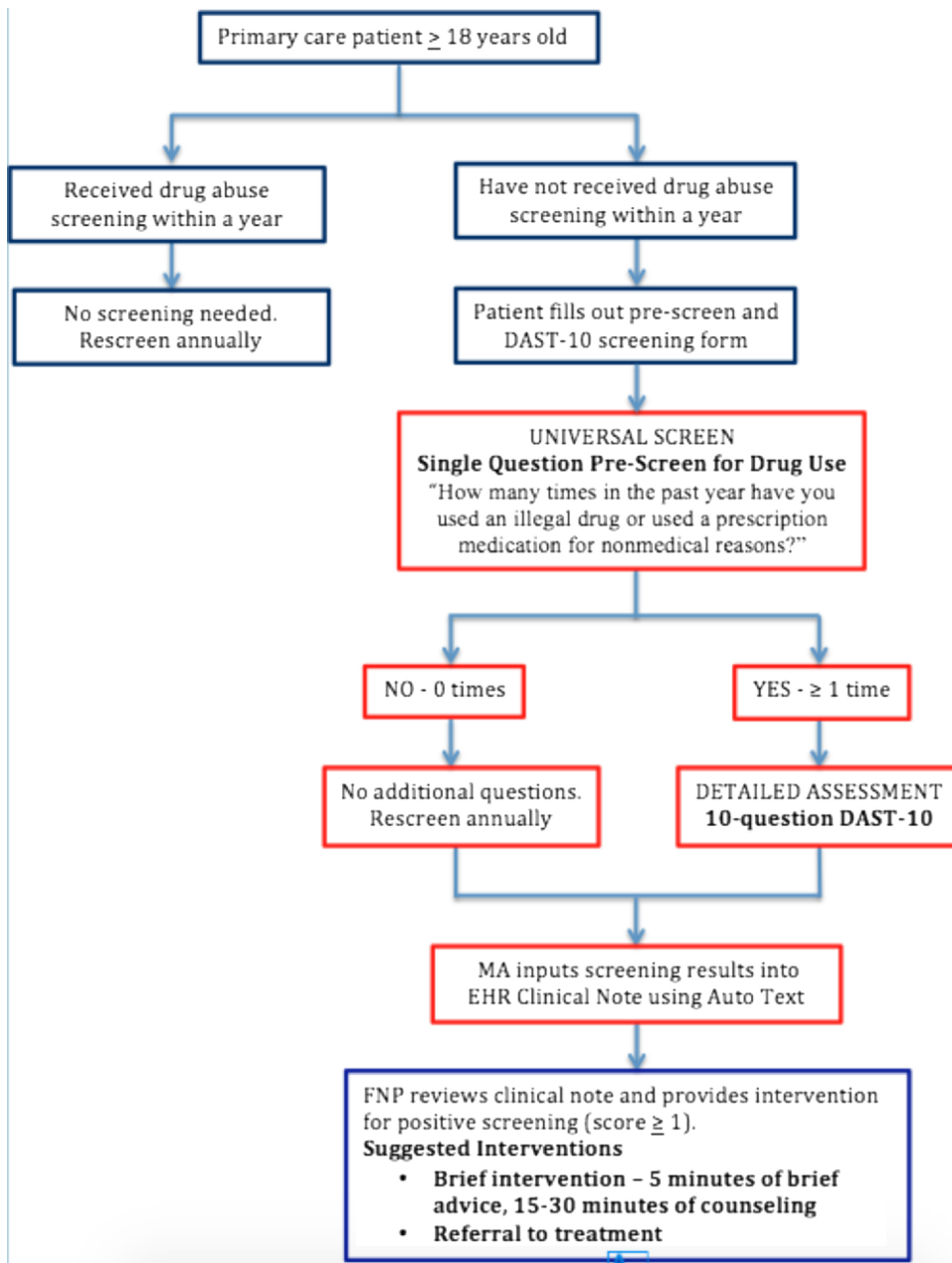


FIGURE 2. Electronic drug abuse screening process workflow map.

which the patient was not eligible for the DAST-10 because screening had been completed within a year was about the same in both electronic and paper screening (51.9% vs 55.8%, respectively).

As the previous paper screening process required the medical records department to scan the DAST-10 screening into the patient's electronic chart, scan rates were evaluated. Of the 62 completed DAST-10 paper screenings, only 17.7% were scanned into the patient's electronic chart at the time of the audit. There was not enough staff to scan all of the relevant paper-

based medical records into the EHR. In addition, this clinic was a part of a larger academic medical institution whose medical records department was located 4 miles away. Due to the distance, paper screenings might not have been delivered to medical records department for scanning. It is important to note that although the entire DAST-10 screening form might not have been accessible in the EHR, raw scores were. Medical assistants entered the DAST-10 raw scores within the history section of the patient intake form during both the pre-intervention phase (paper-based screening) and the

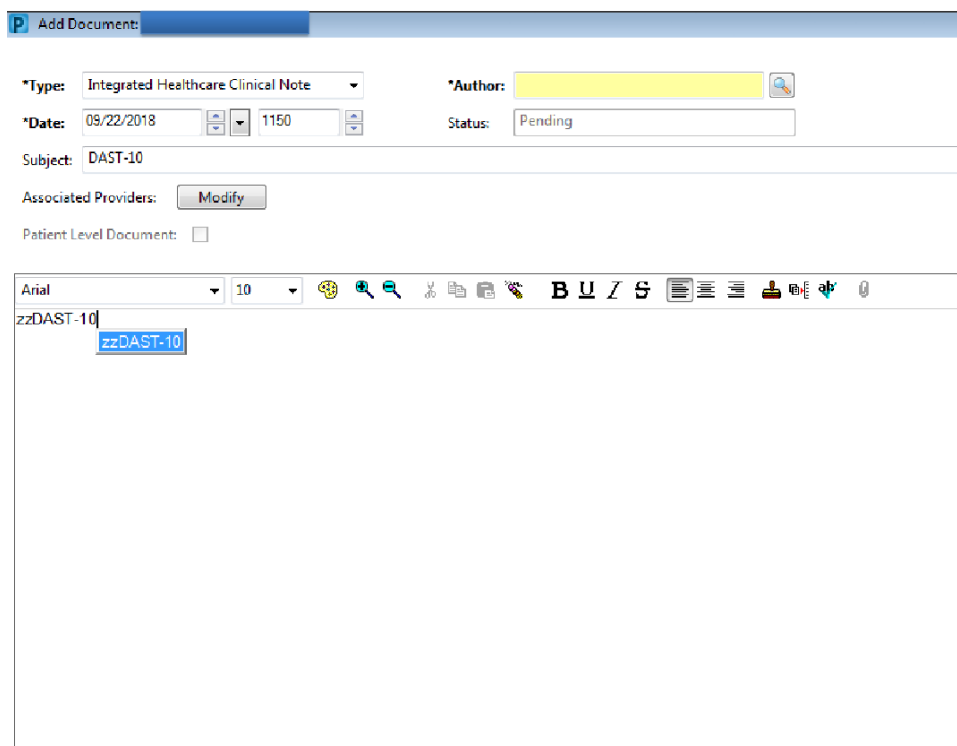


FIGURE 3. Screenshot of DAST-10 Cerner Auto Text abbreviation that inputs the saved phrase. This material contains confidential and copyrighted information of Cerner Corporation (North Kansas City, MO). Used with permission.

postintervention phase (electronic screening). The EHR would automatically associate the date and time of entry for the DAST-10 raw score. This allowed the MAs to determine whether a patient was eligible to be rescreened if they had not received a DAST-10 screening within a year.

The FNP interventions for positive DAST-10 screenings were higher with electronic screening versus paper screening (54.5% vs 21.4%, respectively). A total of 19 charts were reviewed for the preintervention evaluation, and a total of 11 charts were reviewed for the postintervention evaluation. This 33.4% increase in FNP interventions for positive DAST-10 screening was not statistically significant ($P = .1081$). For the positive screening interventions during the preintervention paper screening process, all interventions provided were psychiatric referrals. This is compared to the positive screening interventions during the postintervention electronic screening process where all interventions provided were brief intervention.

The DAST-10 positive screening results were higher with paper screening versus electronic screening (30.6% vs 9.7%, respectively). This 20.9% decrease in positive DAST-10 screenings was statistically significant ($P < .001$). A total of 62 completed DAST-10 screenings were reviewed during the paper screening process, and a total of 113 completed DAST-10 screenings were reviewed during the electronic screening process.

All staff members including four MAs and three FNPs were interviewed for qualitative feedback on the new electronic screening process as depicted in Table 2. All staff members noted that the new process increased workload and took time to get accustomed to. One FNP noted that in the beginning it was hard for her to prioritize drug abuse in her patient visits as there were many other primary care issues that needed to be addressed. With continued education and reinforcement by the project leader and clinic administration, FNPs began to incorporate drug abuse care into patient visits. All FNPs noted that the DAST-10 results appeared in a different EHR location than the other mental health screenings, requiring visits to multiple EHR locations to review results. One FNP was able to consolidate all the mental health screening results by copying and pasting the DAST-10 results into her provider's note. This information was shared with the other providers to encourage consolidation of all mental health screening results into one visible location in the EHR.

DISCUSSION

This quality improvement study explored the impact of electronic documentation of the DAST-10 using existing tools in the EHR without specialized support to increase completed screenings and provider interventions for positive screenings. As building new specialized electronic screening forms is

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Subject: DAST-10

Associated Providers:

Patient Level Document:

Arial 10

STEP 1 - Single Question Screening Test for Drug Use

How many times in the past year have you used an illegal drug or used a prescription medication for nonmedical reasons?

Interpretation of Score

Score	Suggested Action
0	STOP. Do not proceed to Step 2 - DAST-10.
1 or more	Proceed to Step 2 and complete DAST-10.

STEP 2 - DAST-10

These questions refer to the past 12 months

	No	Yes
1. Have you used drugs other than those required for medical reasons?	0	1
2. Do you abuse more than one drug at a time?	0	1
3. Are you always able to stop using drugs when you want to? (If never use drugs, answer "Yes")	1	0
4. Have you had "blackouts" or "flashbacks" as a result of drug use?	0	1
5. Do you ever feel bad or guilty about your drug use? If never use drugs, choose "No."	0	1

FIGURE 4. Screenshot of DAST-10 Cerner Auto Text in a clinical note. This material contains confidential and copyrighted information of Cerner Corporation. Used with permission.

costly and requires the support of the IS department, primary care providers can improve the drug abuse screening process using EHR tools already available to them. This can keep costs low without the need for human and financial resources to create specialized electronic screening forms.

This study detailed and examined the use of an alternative process to an electronic DAST-10 screening form created and supported by the IS department. At the time of the project, the IS department was unable to allocate resources to an automated electronic DAST-10 screening, as they were assisting in a hospital-wide EHR system switch that would take place within the next 2 years. This alternative process was created and implemented, as the clinic needed a method to improve their screening process sooner rather than later. Reliance on the IS department to create a solution for an area of improvement, in this case the drug abuse screening process, can become a barrier to implementation success. Clinics are bound by the constraints of the IS department. Instead, this project showed how individuals can use EHR tools that are accessible to create solutions to improve patient outcomes independent of the resource constraints of the IS department.

Although this alternative process was successful and allowed clinic staff to independently document the DAST-10 screening

in the EHR, it was not entirely seamless. The providers relied on an electronic flowsheet to gather a quick snapshot of the patient's health at that specific encounter as well as to compare screening results with previous encounters. The alternative process described in this study could not input the DAST-10 screening results into the flowsheet, forcing providers to view the DAST-10 results separately from other patient results in the flowsheet. In addition, the MAs were charting DAST-10 screening results twice. First, the MA would chart the entire DAST-10 screening in a clinical note using the new electronic documentation process, as well as chart the raw score in the patient intake form. Charting the raw score was essential, as this allowed staff members to easily identify when a patient was previously screened, if at all. Otherwise, MAs would have to search through the long list of clinical notes to find the DAST-10 screening. Double charting is not desirable, as this decreases efficiency and takes away from valuable clinic time.

Information systems support for electronic screening forms provides the ability to pull screening scores into the flowsheet where providers can view multiple patient screening results at the same time. Information systems design of high-tech specialized screening forms should be attempted first. If IS support is absolutely not possible, then this alternative process

Table 1. Outcome Measure Results Pre- and Post-Electronic Screening Intervention

Outcome Measures	Preintervention, % (n)	Postintervention, % (n)	P
DAST-10 completed screenings	21.5 (62)	30.5 (113)	<.001
DAST-10 missed screenings	26.7 (77)	13.7 (51)	<.001
DAST-10 not eligible screenings	51.9 (150)	55.8 (207)	—
FNP provided intervention for positive screening	21.4 (4)	54.5 (6)	.1081
FNP did not provide intervention for positive screening	78.9 (15)	45.5 (5)	.1081
DAST-10 positive screening	30.6 (19)	9.7 (11)	<.001
DAST-10 negative screening	69.4 (43)	90.3 (102)	<.001

can be utilized to improve patient screening and assessment with the technology that is already available.

After discussion with the clinic administration team, it was decided that patients would continue to fill out the DAST-10 paper screening form in the waiting room. The MAs would then use the new electronic documentation process to transfer the patient's answers into the computer for provider assessment. Although reentering data can increase the risk of input error, the risk for self-report bias may be higher if an MA asked a patient the DAST-10 screening questions compared to a self-administered screening. Screening respondents have a tendency to underreport socially undesirable activities and overreport socially desirable ones due to the need for social approval.¹⁷ When asking patients to report sensitive information such as drug use, there needs to be careful consideration about the screening methods to decrease discomfort and embarrassment for the patient, to encourage patients to answer more truthfully. If a provider does not know about a patient's drug use due to the patient misreporting or not being honest, this delays treatment for an unrecognized problem. Since the DAST-10 was administered annually, a large number of patients screened were new to the clinic. A new patient may answer more honestly with increased anonymity built into the screening process, using self-administered screening instead of face-to-face screening with an MA.¹⁷ Although there is a risk for input error with this method, it was more important for this clinic to gather honest answers from patients so that providers could make informed patient treatment decisions.

Findings showed that high rates of completed screenings were achieved with administration-supported comprehensive staff education. Electronic screening education must include the opportunity and time for staff members to practice the electronic screening process before using it with actual patients. In addition, integrating the electronic screening within the staff's existing workflow processes helped to gain the cooperation of staff members. Initially, MAs noted that it took substantial time to complete the electronic screening documentation process compared to the paper screening process. As they completed more electronic screening documentations, MAs became more efficient and noted the convenience in using electronic screening documentation over paper screening. With electronic screening documentation, patient screenings immediately became a part of the EHR. With paper screening documentation, the medical records department must scan the paper screening into the EHR, which increases the risk of misplaced papers and therefore screenings that never get scanned into the EHR. Electronic screening offers an instantaneous electronic copy of the screening, allowing all healthcare professionals on the patient care team the ability to view the screening results and make patient treatment decisions.

As drug abuse is increasing in the United States, primary care providers must play a larger role in identifying and treating patients with substance use-related problems. A primary care provider may be the first and only healthcare professional to have contact with patients who have substance use-related problems. With the long-standing patient-provider

Table 2. Staff Electronic Screening Input

	MAs, % (n)	FNPs, % (n)
Preferred or indifferent to electronic screening process	75 (3)	100 (3)
Took time to get accustomed to new screening process	100 (4)	100 (3)
Preferred less paperwork	75 (3)	66.7 (2)
Increased the workload	100 (4)	100 (3)
DAST-10 results in different EHR location than other mental health screenings	—	100 (3)
More aware of mental health screenings for patient assessment	—	100 (3)

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relationship, primary care providers are in a position to intervene on the sensitive subject of drug abuse.

Study findings suggest that FNPs may have trouble acknowledging that drug abuse identification and treatment are a primary care issue that affects the many physical and social domains of their patients' health. With the limited amount of time allotted per patient visit, FNPs prioritized other primary care issues such as hypertension, diabetes, or tobacco use. From a provider's perspective, electronic integration of the DAST-10 seems to hold providers at a higher level of accountability as the screening form becomes an instant, permanent part of the patient's EHR with positive results requiring immediate attention.

It takes time to change primary care providers' perspectives on the significance and relevance of drug abuse identification and treatment in primary care. Family nurse practitioners noted that it took time to get accustomed to the new electronic screening process that increased the provider's role in the care of patients with drug abuse problems. Continued education and reinforcement of the need for identification and treatment of patient drug abuse helped staff members to understand that drug abuse treatment is a primary care issue that deserves utmost consideration. This is reflected in the increased rate of provider interventions for positive screenings after education and implementation of electronic drug abuse screening. It is important to note that changing perspectives and workflow is not instantaneous. By identifying the importance of existing workflow processes, barriers to electronic screening, and consistent reinforcement, clinics can begin to change the work culture to acknowledge that drug abuse is a significant healthcare issue in primary care and take the appropriate actions to intervene and treat.

Clinic staff were able to provide early identification and intervention for patients with drug abuse to help promote their physical and mental well-being. The Medicare cost of inpatient psychiatric hospitalizations for drug use disorder treatment is \$4591 for 5.2 days.¹⁸ Early identification and intervention in primary care can help to alleviate this substantial financial cost to hospitals and taxpayers and decrease health disparities in the community.

It is important to note that a substantial percentage of patients screened positive for the DAST-10 in both the paper and electronic screening documentation process (30.6% vs 9.7%, respectively). These alarming percentages reinforced the need for drug abuse screening and provider interventions for patients who screened positive. In addition, the DAST-10 positive screening results were higher with paper screening versus electronic screening, which was statistically significant. This could possibly be explained by the introduction of the single-question prescreen for drug use in the electronic screening process, which was not used in the

paper screening process. Drug abuse is a very sensitive patient topic as illegal drug use may not be something that patients want to disclose. It may be easier for patients to dismiss the single-question prescreen rather than the DAST-10 if they had already decided not to reveal their drug use. More studies are needed to explore the factors that increase or decrease a patient's willingness to honestly answer drug abuse screening questions and whether the introduction of a single-question prescreen affects honesty in drug use self-reporting.

LIMITATIONS

There were some limitations in this quality improvement study. First, the short duration of this specific electronic drug abuse-screening intervention cannot predict the long-term effectiveness. Second, there was a small sample size consisting of only three providers and four MAs. Third, this study used chart audits to compare preintervention and postintervention results to assess for change. There may have been other factors such as project leader presence, continuous education, and administrative support that may have played a role in the results. It is difficult in a quality improvement study to determine causation. As this is a quality improvement study, these results cannot be extended beyond this one specific health center.

CONCLUSION

The implications of this quality improvement study can help providers effectively improve their drug abuse screening process for adult primary care patients. As IS support cannot be guaranteed when creating new electronic screening forms, this study demonstrates that it is possible to use available technology to overcome screening barriers independent of IS support.

Clinic staff members were able to adopt the new electronic screening documentation process to ultimately increase completed screenings and provider interventions for positive screenings. Findings from this study can assist the clinic in positioning itself to increase its role in identifying and treating patients with drug abuse problems, promoting more efficient and effective primary care.

Primary care may be the first and only opportunity for healthcare professionals to interact with patients who have problems related to drug use. It is imperative that evidence-based interventions be implemented to improve drug abuse screening and treatment processes. There should be continued focus on drug abuse screening and treatment in the primary care setting. Further quality improvement studies should focus on the other ways to improve drug abuse screening and treatment in the primary care setting, thus allowing primary care clinics to play a greater role in this growing epidemic.

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Registration Deadline: September 2, 2022

Disclosure Statement:

The authors and planners have disclosed that they have no financial relationships related to this article.

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