Title

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Journal

Substance abuse, 37(3)

ISSN

0889-7077

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Publication Date

2016-07-01

DOI

10.1080/08897077.2015.1127869

Peer reviewed

Teaching Residents SBIRT Skills for Alcohol Use: Using Chart-Stimulated Recall to Assess Curricular Impact

Running title: Resident SBIRT Curriculum: Chart-Stimulated Recall

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This research was funded by SAMHSA grant U79T1020295 awarded to Dr. Satterfield
# of references: 39
tables: 3
figures: 0
appendices: 3
manuscript length: 3817 words

Key Words: alcohol use; curriculum development and evaluation; electronic health record

Author Contributions: Maria Wamsley, Scott Steiger, Katherine Julian, and Nathaniel Gleason participated in study design, collection and

analysis/interpretation of data and manuscript preparation. Patricia O'Sullivan participated in study design, analysis of data and manuscript preparation. Michelle Guy participated in development of EHR tools, data collection and manuscript revision. Jason Satterfield participated in study design and manuscript preparation.

Introduction

There is growing recognition of the spectrum of alcohol use problems and a focus on identifying and intervening for those individuals with at-risk drinking and alcohol use disorders. The U.S. Preventive Services Task Force recommends screening and brief counseling intervention for reducing alcohol misuse by adults in primary care settings.[1] Screening, Brief Intervention, and Referral to Treatment (SBIRT) has been advocated as a strategy to improve identification and early intervention for patients at risk for developing a substance use disorder.[2] Despite the demonstrated efficacy of SBIRT[3,4] and substantial federal resources devoted to residency training[5] many barriers exist to the widespread clinical translation and implementation of SBIRT in clinical practice, including lack of provider skills and confidence, patient related barriers and systems barriers, such as time pressure and a lack of referral resources.[6,7]

Assessing the impact of SBIRT curricular interventions for trainees is challenging. Most published studies show improvement in attitudes, confidence and substance use related knowledge[8-12] and some have demonstrated improvement in SBIRT skills as measured by standardized patient assessments.[13,14] However, standardized patient exams may not reflect the "real world" application of clinical skills. Few studies have looked at application of skills in clinical practice.[15,16,17] Measurement of drinking outcomes alone may give insufficient credit to residents' attempts at applying their new skills. One method of assessment included in the ACGME/ABMS Toolbox[18], chart-stimulated recall

(CSR), uses the medical record to stimulate the learner's recollection of the patient encounter and explore the rationale behind the clinical decisions made in the visit. CSR has been used with practicing professionals and residents to assess clinical skills, specifically identifying areas of strength and weaknesses.[19-21]

The electronic health record (EHR) has been advocated as a tool for integrating substance abuse treatment in primary care through integration of validated screening and assessment tools and decision support tools.[22] A recent systematic review of behavioral change counseling curricula for medical learners found that successful curricula included a focus on addressing gaps in knowledge and performance in the practice environment and reinforcing change over time until the new behavior is well-established.[23] An electronic clinical tool has the potential to provide trainees with ready access to knowledge regarding assessing alcohol use at the point of care and provide instructional scaffolding for the learner by giving them guidance on how to apply newly acquired SBIRT knowledge and skills in a given patient case. These tools could take the form of clinical alerts, guided data collection tools populated during medical visits, decision-support tools and/or self-administered questionnaires for patients. There are no published data on the use of electronic tools to facilitate brief alcohol counseling for resident learners as an adjunct to SBIRT curricula.

We developed electronic tools to facilitate documentation of alcohol assessment and brief intervention, to remind trainees of SBIRT curricular content and provide patients with tailored educational materials on alcohol. These served as an adjunct to reinforce a residency SBIRT didactic curriculum and encourage resident use of SBIRT skills. This study addresses the following research questions:

1. How do residents use SBIRT skills in clinical practice as documented in their charts?
2. How do residents think about SBIRT as revealed through chart-stimulated recall?
3. How do residents use electronic SBIRT clinical tools in practice?

Methods

Study Design

This study combined retrospective chart review of resident-selected patients with a one-on-one interview with a faculty member using the specific charts as prompts to assess resident decision-making and clinical practices.

Participants

This study took place at an academic primary care internal medicine residency program located in an urban area. The clinic where residents practice is a joint resident-faculty practice with a diverse patient population (48% white, 10% African-American, 21% Asian, 22% other) and a mix of payers (27% Medi-caid,

13 % Medi-care, 60% managed care and private insurance). Participants included 10 PGY2 and 10 PGY3 residents.

Primary Intervention

The SBIRT curriculum was an established curriculum entailing 5 hours of instruction and consisted of a mix of didactic information (50% of session) and skills introduction and practice in small groups (50% of session) (Table 1). The curriculum included a session on SUD pharmacotherapy, a topic not traditionally considered to be part of SBIRT trainings, but recommended by some as a way to improve access to SUD treatment.[24] Curricular sessions occurred in August/September 2012 for half of the residents and October/November 2012 for the remainder of the residents. All residents completed the curriculum by December 2012.

We developed electronic tools to assist our trainee providers with SBIRT. Two faculty members—one with expertise in information technology (NG) and another with background training in substance use disorders (MG) developed the electronic tools. Our multidisciplinary faculty team, comprised of faculty with expertise in substance use disorders and curriculum development and primary care clinicians, reviewed and piloted these tools and made suggestions for modifications that were incorporated into the final product. Electronic tools were incorporated as “smartphrases” in the EpicCare[25] ambulatory electronic health record utilized in the clinic. Smartphrases in the Epic system allow for insertion of text or data into a provider’s note. These tools were passively integrated in that

learners were not actively prompted by EHR reminders to use them. Instead, learners had to trigger these tools by typing the words ".alcohol" or ".SBIRT" in their clinical notes or into the after visit patient instructions section of the electronic record. Once initiated by the clinician, electronic tools included prompts to assist providers in 1) documenting a history of present illness in a patient with a possible alcohol use disorder (AUD) or risky drinking (Appendix A) 2) documenting an assessment and plan in a patient with risky drinking or an AUD (Appendix B); and 3) providing patients educational materials about alcohol and SBIRT resources. We introduced electronic tools to all PGY2 and PGY3 primary care internal medicine residents and faculty preceptors in a series of educational conferences and team meetings. These sessions occurred in addition to the 5-hour SBIRT curriculum described above. We demonstrated the use of electronic tools through seminars and web videos. We asked residents and faculty to use electronic tools when they encountered patients in general medicine clinic who screened positive for at-risk alcohol use.

Assessment

In the spring of 2013, we provided residents with a list of the general medicine patients seen in the period between April 2012 - April 2013 who had alcohol use documented in the EHR and who were drinking at or above the recommended limit ($\geq$ 14 drinks per week for men < 65 years old; $\geq$ 7 drinks per week for all women or men > 65 years old)[26,27]. These are the cut-offs that were used for at-risk drinking. In order for patients to be included in the study, their alcohol consumption had to be documented in the social history section of the EHR. In

the EHR, the amount of alcohol consumed is quantified by number of drinks per week. At the time of the study, all patients received a paper-based screen for alcohol and illicit and prescription drug use at their initial clinic visit and annually thereafter. This screening form included the validated single question screen for alcohol ("How many times in the past year have you had x or more drinks in 1 sitting?" where "x" is 4 for women and 5 for men)[28] followed by a question to quantify the average number of days per week that alcohol was consumed and the average alcohol consumption per day. This paper form was provided to the clinician at the time of the visit. Information from the screening form was documented in the medical record either by the medical assistant or the physician at the time of the appointment.

Trainees identified 3 patients from this list to review with a faculty member. Three patients were selected because residents had limited numbers of patients on their lists (range 1-5; mean 2.76) and CSR could be performed on 3 patients in one hour's time. Given schedule constraints of residents and faculty, reviewing all patients identified was not feasible. If residents did not have 3 patients on their list, they were invited to select other patients for review who had substance use issues and were seen during this timeframe. We informed residents that the purpose of the resident-faculty meetings was to explore how residents were using SBIRT skills in clinic and to provide direct feedback on SBIRT skills and documentation.

Chart Review

Our SBIRT team developed a 24-item chart checklist to assess for application of SBIRT skills and use of electronic tools (Appendix C). This checklist has similarities to chart checklists used in other studies of resident SBIRT documentation, but did not include an item to assess for the use of a validated screening tool or assess for the use of prescription medications to help maintain abstinence or referrals for treatment.[17] Faculty participating in the review (MW, KJ, SS, MG, NG) met, practiced using the checklist and agreed upon how the checklist would be applied. Faculty used this checklist to assess the EHR of the 3 patients identified by each resident in advance of a face-to-face CSR meeting. Faculty credited residents for performing any of the items on the checklist provided that they were done in the period after the curriculum (December 2012-April 2013). We asked residents to briefly review the charts in advance of the CSR meeting.

Chart Stimulated Recall

Our team developed a structured chart-stimulated recall (CSR) interview guide for the resident-faculty meetings and piloted the CSR interview tool with one another in a CSR process. Feedback from this process was used to refine the interview guide. Participating residents and faculty met in May and June 2013 and reviewed the EHR of the designated patients using the structured CSR interview guide. If the patient's alcohol use was not identified in the visit note as a pertinent issue, the resident was asked to identify barriers to discussing alcohol use in the visit and how the resident might approach the case differently in the

future. If alcohol use was identified in the visit note, the resident was asked 1) where alcohol use fell on the resident's list of priorities during the visit 2) their assessment of the patient's alcohol use 3) their assessment of the patient's stage of change 4) whether a brief intervention and/or referral was made for the patient's alcohol use 5) barriers to addressing alcohol use during the visit 6) use of SBIRT electronic tools including how tools were used/barriers to use and 7) how the resident might approach the case differently in the future. During the CSR interview, faculty took detailed notes of resident responses to questions. Interviews were not audio or video recorded and transcribed out of concern for patient confidentiality. Participation in the study was entirely voluntary and all procedures were approved by the institutional IRB.

Analysis

Patient charts were excluded from the analysis if 1) the patient was not seen in the timeframe of the study period (December 2012 – April 2013), 2) patients were drinking at, but not above, the limit because brief intervention and/or referral to treatment would not be appropriate in these patients) or 3) the patient was identified by the resident for review but used other substances besides alcohol. Percentages were calculated for each chart checklist item using the patient as the unit of analysis.

Notes from Chart stimulated recall

We conducted a content analysis of all of the interview notes. To generate a preliminary code list, four faculty (MW, KJ, NG, SS) collaboratively analyzed a randomly selected subset of interview notes using group discussion and consensus. This preliminary list was iteratively refined through 2 stages of independent testing and group discussion. First, faculty independently applied the code list to 3 sets of interview notes, testing both conceptual clarity and completeness. Coded items were examined for inter-rater agreement and items with low agreement were discussed in depth until consensus was reached. Coding categories and definitions were revised when necessary. Faculty then independently coded 5 new interviews using the refined code list. Inter-rater agreement exceeding 0.8 for each code was reached. For the full qualitative analysis, all interviews were double-coded by two raters and any differences in coding were reconciled through discussion between the two raters.

Results

All twenty PGY-2 and PGY-3 residents participated in the curriculum. Eighteen residents participated in the CSR (5 males and 13 females). Four residents did not have 3 patients for discussion. Forty-six patient charts were reviewed in the CSR process; 8 patients did not meet eligibility criteria and were excluded from the analysis. The remaining 38 cases were analyzed.

Table 2 displays the results of the chart checklist. Residents documented alcohol use (84.2% of charts) and assessment of quantity and frequency of use (71.0%).

Thirty-four percent of charts had documentation of assessment for an alcohol use disorder with at least one of the DSM-5 criteria. Although residents often documented their recommendation that the patient cut back on alcohol use (60.5%), far fewer documented use of motivational interviewing tools (7.9%) or readiness for change (21.0%). Approximately half of notes documented appropriate plan (50.0%) and follow-up (54%).

Use of SBIRT EHR tools was uncommon. Three charts demonstrated use of the history of present illness tool, 2 charts included the assessment and plan tool, and 5 charts included the electronic patient information tools. Five residents (27.8%) used at least one EHR tool.

Table 3 describes the results of the thematic analysis of the CSR interview with the residents. Content analysis of the CSR included the following themes and subthemes.

Barriers to addressing alcohol use

Residents reported a number of barriers to addressing alcohol use in the visits with their patients. In a small number of cases, residents did not realize patients were drinking above the safe limit. The remaining barriers fell into 3 different categories: 1) Resident-related, 2) Patient-related and 3) Systems-related.

Resident-related barriers included lack of knowledge about guidelines for safe drinking and lack of comfort/skill in addressing alcohol use. Some felt that if a patient did not recognize drinking as risky, was less than honest about drinking, or was unwilling to discuss alcohol use, these were barriers to implementing brief intervention. Residents described additional patient barriers to addressing the patient's alcohol use ranging from marginal housing, familial obligations, and perceived social pressures from friends or colleagues. In terms of systems-related barriers, time was frequently mentioned as a challenge to addressing alcohol use. Residents described the challenges of trying to prioritize multiple issues in the visit including medical and psychiatric comorbidities that made it challenging to address alcohol use.

Facilitators of discussing alcohol use

Residents did identify facilitators to addressing alcohol use including medical and mental health comorbidities that were related to alcohol use and interactions between alcohol and medications.

Brief intervention strategies

The most commonly used brief intervention strategy described by residents was setting goals with the patient to decrease alcohol use. Residents also described linking alcohol use to medical issues and responding to change talk.

Electronic clinical tool use

Residents reported using the electronic clinical tools to provide patients with informational materials and as reminders of the criteria for an AUD and elements of an appropriate plan.

Barriers to electronic clinical tool use

When asked why residents did not use electronic clinical tools, the most common response was lack of comfort in using electronic tools or that such tools were not a part of their charting routine. Many residents were not aware of the tools. Few learners reported not using the tools because they did not meet their needs or because they did not perceive alcohol to be a problem.

Approach to next visit

The most common response to how the resident might approach the case differently in the future was that they would raise the issue of alcohol use in the upcoming visit. Other responses included that they would be more likely to use electronic clinical tools in the future and would take a more detailed substance/alcohol use history. Residents reported that they would try brief intervention strategies including better linking alcohol to medical/mental health issues.

Discussion

Our evaluation suggests that residents applied knowledge and select skills from the SBIRT curriculum in clinic. When patients screened positive for risky drinking,

most residents assessed the level of alcohol use. In only a few instances did residents cite a lack of knowledge about either the patients' drinking or what constitutes safe drinking limits. A minority of residents used motivational interviewing strategies. Most at-risk drinkers in our study were advised to cut down and most residents documented a plan for follow-up. Residents perceived barriers to addressing alcohol use with patients including time limitations and the need to balance competing medical and mental health issues. Residents also cited a perceived lack of patient willingness to discuss alcohol or denial on the part of the patient as barriers to performing brief intervention.

These results are consistent with previous evaluation of internal medicine resident alcohol curricula, including randomized control trials of SBIRT-like programs,[15,29] pre-post assessments using standardized patients,[13] and chart review.[30] Also similar to previous studies, a minority of residents used motivational interviewing strategies in their brief intervention. These results may suggest inadequate support or time for practicing motivational skills within the curriculum or the practice.

Adoption of the SBIRT EHR tools in clinical practice was low, limiting the potential of these tools to reinforce application of the curriculum. This finding is consistent with the experience of others. Interventions in which users are actively prompted to use a decision support tool at the key decision point in clinical care consistently show higher adoption than do tools that must be initiated by the

user.[31-33] Integration into the clinical workflow is repeatedly shown to be a strong and independent predictor of adoption. True integration of these tools into the clinical workflow using active prompts requires EHR customization and may have implications for users outside the program scope. Resources for, and approval of, such customization represent real barriers to implementation of programs intended primarily for trainees. Given the constraints of “passive” EHR tools, additional learner reinforcement is needed. Many residents reported that they were unaware of the tools, suggesting that precepting faculty may also need more training in use of EHR tools in order to better reinforce use by the residents. A sizable minority of residents also reported that they did not feel comfortable using this type of tool in general, which may be symptomatic of a broader need to improve resident EHR competencies.

It is possible that using chart-stimulated recall formatively then re-checking performance later could have been a more effective educational intervention. CSR offers advantages beyond other means of curriculum assessment, particularly the potential for formative assessment of learners and for redesigning curriculum. The final section of the CSR interview was designed to inspire case-specific planning for future visits, and on average the residents supplied more than one response per patient. Another iteration of CSR could evaluate whether the interview with an engaged faculty member was effective in increasing implementation of SBIRT strategies. CSR also revealed a relative weakness of the curriculum involving resident perception about a lack of time for SBIRT and a

belief that if the patient was unwilling to engage in a discussion about alcohol use, SBIRT skills should not be employed. Future iterations of the curriculum will emphasize that interventions ought to be brief and patient-centered, even—or especially—for the pre-contemplative patient. Simple chart review, standardized patient assessment, and real patient interviews would not have yielded this information.

Although CSR and EHR tools appear to have promise in residency education, there are a number of important limitations to the current study. In terms of study design, we did not assess resident application of SBIRT skills prior to the curriculum so could not be sure that there was a change in skills as a result of our curricular intervention. We did not track attendance at the conferences where the EHR tools were introduced or track viewing of the video demonstrations. Thus, it is possible that not all residents received an adequate orientation to EHR tools and this may have impacted use. Additionally, qualitative materials were not verbatim interview transcripts. Faculty interviewers took detailed notes for each interview but may have omitted important information and/or inserted editorial comments that influenced the subsequent coding scheme.

There were a number of limitations related to the participating residents and faculty. We did not analyze resident demographics, attitudes toward alcohol use, or personal or family history of substance use, all of which have been associated with differences in provider approach to patients with risky drinking.[34-37] We did

not assess faculty knowledge and facility with SBIRT; both of these factors could have contributed to a hidden curriculum that may have impacted the application of resident SBIRT skills. Faculty interviewers also served as regular resident preceptors. This dual role could have altered the content of what residents were willing to share or influenced learner report about how they would change their approach to patients in the future. Additional bias could have been introduced by allowing residents to identify the patients to be discussed during the CSR interviews. While faculty provided a list of eligible patients, residents selected the 3 patients for the CSR. Self-serving bias may have led residents to select cases where they performed well. However, our data showing poor performance in many categories suggest otherwise, and the numbers of patients in each resident list was relatively small which meant that in most cases all of the eligible patients on a resident's list were reviewed, limiting the potential for selection bias.

Finally, patient characteristics may have influenced our results. Our sample size was too small to appreciate patterns in SBIRT application based on patient race, ethnicity, or gender, which have each been shown to affect frequency of counseling about alcohol use.[38,39] Our limited number of encounters did not permit us to draw meaningful conclusions regarding how these factors affected the performance of SBIRT.

Our results suggest that residents do address alcohol use with patients, but that despite instruction in motivational interviewing techniques, they are less likely to

employ these strategies in practice. More fundamental training in behavioral techniques with ongoing opportunities to practice and receive feedback may be required before we could expect improved performance. The CSR assessment was a useful tool for better understanding what took place in clinical encounters and how SBIRT was being integrated into clinical practice by the residents. Finally, although EHR tools may play a role in reinforcing curricular content by scaffolding learning, additional efforts must be made to encourage adoption of these tools into the routine workflow of trainees and practicing physicians in order for them to be useful.

Acknowledgements
This research was funded through a SAMHSA grant U79T1020295. SAMHSA had no role in the design and conduct of the study; collection, management, analysis, and interpretation of data; preparation, review, or approval of the manuscript; and decision to submit the manuscript for publication.

Conflict of Interest
The authors have no conflicts of interest to disclose.

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Table 1: Description of SBIRT Curriculum

Session Goals	Learning Objectives	Activities	Duration
• Introduction to SBIRT • Screening for alcohol and substance use • Tools for screening • Assessing alcohol and substance use • Documentation of alcohol and substance use in the EHR	• Define "screening, brief intervention, and referrals to treatment" (SBIRT) and describe its relevance to primary care. • Use and interpret NIAAA and NIDA screening questions for alcohol and other substance use disorders including the DGIM patient pre-screening form. • Apply DSM-IV assessment questions to evaluate patients for substance abuse and substance dependence disorders. • Demonstrate the efficient collection of essential medical and psychosocial data relevant to	• Didactic presentation • Role play with feedback • Small group discussion	90 minutes

	determining substance use risk, prognosis, and treatment planning. • Describe how to document substance use and related data in EPIC and how this data should be used for current and future medical care.		
• Introduction to brief intervention • Introduction to motivational interviewing tools • Motivational interviewing skills practice	• Discuss the evidence that support the use of brief intervention in patients with alcohol misuse. • Describe the four components of a brief intervention (raise the subject, provide feedback, enhance motivation and negotiate a plan). • Demonstrate the use of the readiness ruler and decisional balance tools	• Didactic presentation • Video demonstration • Roleplays with feedback • Small group discussion	90 minutes

	in a brief intervention roleplay.		
• Pharmacologic management of substance use disorders	• List the medications currently FDA-approved for the treatment of alcohol, opioid, and other substance use disorders (SUDs) and provide clinical illustrations of appropriate use in primary care. • Identify a patient's stage of disease and whether and when to use pharmacotherapy including key indications and contraindications	• Didactic presentation • Case discussion	120 minutes

Table 2: Documentation of SBIRT and Use of Electronic Tools

SBIRT Checklist Item	Patients (n=38)
	N (percent)
Alcohol not dealt with in any visit during the study	4 (10.5)
Screening Documentation	
Alcohol use	32 (84.2)
Assessment of quantity and frequency of use	27 (71.0)
Assessed for at least one of the following: bodily harm, legal problems, etc.	13 (34.2)
Brief Intervention Documentation	
Motivational interviewing tools	3 (7.9)
Readiness for change	8 (21.0)
Recommendation to cut down	23 (60.5)
Appropriate plan	19 (50.0)
Follow-up	21 (55.3)
Electronic clinical tools	
Alcohol history of present illness tool	3 (7.9)
Assessment and plan and tool	2 (5.3)
Patient information electronic resource	5 (13.2)

Table 3: Content Analysis Chart-Stimulated Recall

Theme and subcategories	N (percent) (n=38)
Barriers	
Resident-related	
Resident knowledge/skills	8 (21.1)
Unaware of patient drinking	3 (7.9)
Patient-related	
Patient willingness to engage in discussion	20 (52.6)
Social barriers	7 (18.4)
Systems-related	
Time	21 (55.3)
Facilitators	
Medical comorbidities	6 (15.8)
Mental health comorbidities	3 (7.9)
Potential medication interactions with alcohol	2 (5.3)
Brief Intervention Strategies	
Readiness ruler	2 (5.3)
Decisional balance	1 (2.6)
Responding to change talk	3 (7.9)
Linking alcohol to medical issues	3 (7.9)
Setting goals with patient	8 (21.1)
Harm reduction	1 (2.6)
Electronic clinical tool use	
Developed own electronic clinical tools	2 (5.3)
Reminder of criteria for SUD	3 (7.9)
Reminder of BI strategies	1 (2.6)
Assist in development of appropriate plan	2 (5.3)
Patient informational resources	2 (5.3)
Barriers to electronic clinical tool use	
Not part of regular workflow/lack of comfort with use	12 (31.6)
Unaware of existence of electronic clinical tools	11 (28.9)
Don't meet learner needs	3 (7.9)
Didn't perceive alcohol use as a problem	2 (5.3)
Approach in future visits	
Raise alcohol use in visit	13 (34.2)
Detailed history of alcohol/substance use	5 (13.2)
Link alcohol to mental health/medical issues	6 (15.8)

Use brief intervention strategies	6 (15.8)
Recommend patient cut back on alcohol	2 (5.3)
Order urine toxicology screen	1 (2.6)
Better documentation of alcohol use	3 (7.9)
Use electronic clinical tools	7 (18.4)
Outreach to patients lost to follow-up	2 (5.3)