white PAPER

PARTNERSHIP for HEALTH IT PATIENT SAFETY
a national collaborative

Optimizing Health IT for Safe Integration of Behavioral Health and Primary Care

Convened by

ECRI

EHRA HIMSS ELECTRONIC HEALTH RECORD ASSOCIATION

With funding from

GORDON AND BETTY MOORE FOUNDATION

Acknowledgments

We would like to thank the workgroup chairs and all of those who contributed to the workgroup and the development of safe practices. Thank you to the workgroup co-chairs David Bucciferro (Foothold Technology), vice chair EHRA, co-chair EHRA Patient Safety Workgroup, co-chair EHRA Opioid Crisis Task Force; Mark Segal, PhD (Digital Health Policy Advisors, LLC), consultant to ECRI; and Patricia Giuffrida, MSN, RN, CPHIMS (ECRI), senior patient safety and health IT safety analyst. We thank those who presented to the workgroup throughout the various meetings, sharing valuable information and techniques with the workgroup members, in particular Kristen Lambert, JD, MSW, LICSW, FASHRM, CPHRM (Trust Risk Management Services); Evelyn A. Segal, PhD (Loyola University), associate professor of family medicine and psychiatry & behavioral neurosciences; and Hans J. Buitendijk, MSc, FHL7 (Cerner), director interoperability strategy, chair of EHRA, for their presentations. We are also grateful for the assistance provided by Kristi Feliksik (EHRA, HIMSS North America), senior associate; Jessie Bird (EHRA), CAE, manager, strategic relationships; and Kasey Nicholoff (EHRA), program manager.

Finally, we thank all of the participants listed below who volunteered and gave freely of their time and contributed valuable information throughout the workgroup process. The ability to collaborate and to share this information contributed to the workgroup meetings and to the development of this publication.

Co-chairs

David Bucciferro, Foothold Technology

Mark Segal, PhD, FHIMSS, Digital Health Policy Advisors, LLC

Patricia Giuffrida, MSN, RN, CPHIMS, senior patient safety and health IT safety analyst, ECRI

EHRA Workgroup Participants

Jonathan Azzariti, athenahealth

Jayte Boehler, BestNotes

Janice Burns, MEDITECH

Sean Coberly, AdvancedMD

Sherry de Cuba, Greenway Health

Michael Favreau, Allscripts

Christina Gonzales, BestNotes

Cherie Holmes-Henry, NextGen

Richard Hornaday, Allscripts

David Hurwitz, Allscripts

Hayder Hussein, Modernizing Medicine

Tom Kunzler, BestNotes

Leslie Lindsay, Cerner

David Little, MD, Epic

Debbie McKay, Allscripts

Peter Minio, Office Practicum

Amila Patel, Flatiron Health

Carol Reynolds, Netsmart

Marilyn Snyder, Allscripts

Matthew Switzler, Epic

Contributors

Hans J. Buitendijk, MSc, FHL7, director, interoperability strategy, Cerner

Kristen Lambert, JD, MSW, LICSW, FASHRM, CPHRM, Trust Risk Management Services

Evelyn A. Segal, PhD, associate professor of family medicine and psychiatry & behavioral neurosciences, Loyola University

EHRA

Jessie Bird, CAE, manager, strategic relationships

Kristi Feliksik, senior associate, EHRA, HIMSS North America

Kasey Nicholoff, EHRA program manager

ECRI Internal *Partnership* Contributors

Asa Adadey, MS, data scientist

Julia L. Barndt, MA, editor

Carol Beckman, MSI, MSE, senior research librarian

Robert C. Giannini, BS, NHA, CHTS–IM/CP, patient safety analyst and consultant

Ben Pauldine, MBA, art manager

Lorraine Possanza, DPM, JD, MBE, FACFOAM, FAPWCA, program director, *Partnership for Health IT Patient Safety*

Amy Stone, MLS, library director

Diana Winters, copyeditor

Andrea Zavod, managing editor

Expert Advisory Panel

David Bates, MD, MSc, Brigham and Women's Hospital

Kathleen Blake, MD, MPH, American Medical Association

Pascale Carayon, PhD, University of Wisconsin-Madison College of Engineering

Christoph Lehmann, MD, UT Southwestern

Peter J. Pronovost, MD, PhD, University Hospitals

Daniel J. Ross, MD, DDS, Department of Defense, Defense Health Agency

Jeanie Scott, MS, VHA Office of Informatics and Analytics Health Informatics

Patricia P. Sengstack, DNP, RN-BC, CPHIMS, Vanderbilt University Medical Center

Hardeep Singh, MD, MPH, Michael E. DeBakey VA Medical Center and Baylor College of Medicine

Dean Sittig, PhD, The University of Texas Health Science Center at Houston, School of Biomedical Informatics

Paul Tang, MD, MS, IBM Watson Health

Gordon and Betty Moore Foundation

We offer special thanks to the Gordon and Betty Moore Foundation for their generous support in building a sustainable private sector infrastructure for effective health IT patient safety practices.

GORDON AND BETTY MOORE FOUNDATION

©2021 ECRI. All Rights Reserved.

Partnership Collaborating Organizations*

* Healthcare providers and provider organizations participate in the *Partnership*. However, they are not listed here as they submit event information confidentially under the protections of ECRI and the Institute for Safe Medication Practices Patient Safety Organization.

Convened by ECRI

EHRA HIMSS ELECTRONIC HEALTH RECORD ASSOCIATION

With funding from GORDON AND BETTY MOORE FOUNDATION

©2021 ECRI. All Rights Reserved.

Contents

Executive Summary 5
Introduction 6
- Background 6
- Models for Integrated Care 7
- Workgroup Process 8
- Data Analysis 9
- Data Limitations 10
- Literature Review Summary 11

Recommendations 12
- Discussion 12
- Screening 14
- Documentation 15
- Sharing 18
- Measures by Prong 20
- Learnings 20

Conclusion 21
References 22
Appendix A. Literature Review 24
Appendix B. Recommendation Tables 40
Appendix C. Health IT-Enabled Workflow for the Safe Integration of Primary Care and Behavioral Health 46
Appendix D. Screening Tools Tables 49
Appendix E. Behavioral Health Exchange Data Elements 55
Appendix F. Behavioral Health Data Domain 56

©2021 ECRI. All Rights Reserved.

Executive Summary

Behavioral health issues are seen and treated by different types of clinicians, including those in behavioral health as well as those in primary care. The work presented here does not encourage or prefer a particular setting of care. Rather it works to facilitate information exchange among the clinicians providing care.

The integration of behavioral health and primary care is a preferred model of care because it fills current treatment gaps.[1] In January 2020, ECRI through its *Partnership for Health IT Patient Safety*, in collaboration with HIMSS Electronic Health Record Association (EHRA), convened the Optimizing Health IT for Safe Integration of Behavioral Health and Primary Care workgroup. Building on the success of earlier collaborative work done through the Safer Opioid Prescribing workgroup, EHRA and ECRI came together once again to collaborate on advancing health information technology (IT) safety.

Health IT is a necessary foundation for improving healthcare delivery;[2] these technologies can also be useful in improving identification of behavioral health needs, helping clinicians communicate about those needs with one another, and improving patient care. With that opportunity in mind, the workgroup focused on identifying how to best use technology to safely facilitate the integration of behavioral health and primary care. It settled on a three-pronged approach consisting of screening, documentation, and sharing. These three prongs, or important spheres of action, can differ in how they are executed in behavioral health and in primary care settings. They are also highly interrelated. Across these three prongs, information must be captured using vocabularies that are understood by those who create and access clinical data, and it must be possible to transfer the information among clinicians and other users.

Behavioral health issues that may arise during primary care visits include:

- Mental health problems
- Substance use problems
- Behaviors that contribute to chronic health conditions (e.g., asthma, diabetes, high blood pressure)
- Stressful life situations or crises
- Stress-related physical symptoms
- Opportunity to communicate to the patient the benefits of regular use of primary healthcare while avoiding unnecessary emergency department or urgent care visits or hospital use

This information must also aid recognition of clinical needs so that care can be initiated, better communicated, measured, and shared. Improving recognition of needs, collaboration, and communication requires a focus on technology's function, data fields, tool integration, and metrics for internal and external use. This report summarizes workgroup findings, recommendations, and strategies for using technology to facilitate the integration of behavioral health and primary care.

©2021 ECRI. All Rights Reserved.

Introduction

The World Health Organization and the U.S. Surgeon General have called for integration of behavioral health treatment into primary care as the most efficient and effective way to address the treatment gap for the estimated 50% of behavioral health conditions that go undiagnosed.[3] Although depression is among the most common chronic conditions encountered in the primary care setting, one in four adults in the United States has a diagnosable behavioral health condition that may be unrecognized or untreated.[3] Primary care settings provide an ideal gateway to increase access to behavioral healthcare and treatment.[3] Technology can greatly enable integration of behavioral health with primary care. Notably, the ability to use health information technology (IT) to reduce patient risk has been broadly recognized and highlighted in the peer-reviewed literature;[4-7] in ECRI's Top 10 Health Technology Hazards; in the collaborative work of the *Partnership for Health IT Patient Safety*; and by HIMSS Electronic Health Record Association (EHRA). Given this focus, the EHRA and ECRI's *Partnership for Health IT Patient Safety* teamed together to identify strategies and actions to optimize health IT for the safe integration of behavioral health with primary care. The report and safe practice recommendations arising from the collaborative effort follow.

Background

Behavioral health encompasses addressing behavioral factors in chronic illness care, care of physical symptoms associated with stress, and modification of health-related behaviors, as well as mental health and substance use disorder (SUD) diagnosis and treatment. The term "behavioral health integration" is used to emphasize the broad applicability of holistic health services in medical care.

Integrated behavioral health and primary care is defined as the comprehensive care that a patient experiences as a result of a team of primary care and behavioral health clinicians working together with the patient and family, using a systematic and cost-effective approach to provide patient-centered care for a defined population. This care may address mental health and SUD, health behaviors (including their contribution to chronic medical illnesses), life stressors and crises, stress-related physical symptoms, and ineffective patterns of healthcare utilization.[8]

"Integration" of behavioral health and primary care has been identified as a promising approach to achieving enhanced patient care and improving patient safety as well as care quality and clinical outcomes. As with other aspects of healthcare, technology-enabled tools, including electronic health records (EHRs), clinical decision support (CDS), and standards-based interoperability, can enhance the ability of integration to achieve these goals. EHRs are the primary health IT tools used in primary care practices[9] but are not implemented as widely or often in the same manner in behavioral health settings. To date, most EHRs have not been designed specifically to support integrated behavioral health and primary care.[10] To enable integrated care, and to realize the potential of technology, EHR functionality must keep pace and incorporate information (e.g., screening and documentation), CDS, and the interoperability needs of integrated behavioral health and primary care models.[9]

Why should we integrate behavioral health with primary care?

- Eighty percent of people with a behavioral health disorder will visit a primary care provider at least once a year.
- Fifty percent of all behavioral health disorders are treated in primary care.
- Forty-eight percent of appointments for all psychotropic agents are with a nonpsychiatric primary care provider.
- Sixty-seven percent of people with a behavioral health disorder do not get behavioral health treatment.
- Thirty percent to 50% of patients referred from primary care to outpatient behavioral healthcare do not keep their first appointment.
- Two-thirds of primary care physicians report not being able to access outpatient behavioral healthcare for their patients.

Shortages of mental healthcare providers, health plan barriers, and lack of coverage or inadequate coverage were all cited by primary care providers as critical barriers to mental healthcare access.

Source: Benefits of integration of behavioral health. [internet]. Washington (DC): Primary Care Collaborative (PCC); 2020 [accessed 2020 Oct 13]. [4 p]. Available: https://www.pcpcc.org/content/benefits-integration-behavioral-health

©2021 ECRI. All Rights Reserved.

The joint project discussed in this report grew out of the recognition that a significant and largely unrealized opportunity exists for health IT to play a role in the safe integration of behavioral health with primary care that can emerge from a multidisciplinary and collaborative approach. Central to this approach is a focus on patient safety. EHRA has developed a Code of Conduct[11] for EHR and health IT developers reflecting the need for such collaboration, as does the evolving work conducted by the *Partnership*. Building on the success of the Safer Opioid Prescribing workgroup, EHRA and ECRI, through the *Partnership for Health IT Patient Safety*, came together once again to collaborate on health IT safety in looking at this pressing issue. The collaborative work is informed by synergies from combining EHR developer expertise, information, and perspectives with the *Partnership*'s evidence, knowledge, data, and data analysis available from ECRI in its role as a patient safety organization (PSO). This project highlights what can be accomplished using such a collaborative model.

Models for Integrated Care

The integration of behavioral health and primary care can be accomplished using a variety of models, with a common goal of providing relevant and actionable information to facilitate timely, high-quality, and holistic care to patients. Models range from minimal collaboration, in which primary care and behavioral health clinicians working in different locations use unique EHR systems, to a fully collaborative model, in which behavioral health and primary care clinicians work in the same location and share the same EHR. Behavioral health clinicians can include psychiatrists, psychologists, counselors, social workers, and others. Primary care clinicians can include physicians, nurse practitioners, other nurse professionals, physician assistants, and others.

Patients presenting to the primary care provider with a behavioral health issue may have their treatment provided within any of a variety of care models. Integrated care takes many forms, the patient may receive behavioral healthcare from the primary care provider; the patient may receive a referral for behavioral healthcare; or behavioral health services may be provided by behavioral health and primary care clinicians in the same organization. In practice, care may be provided using one of several models with varying degrees of integration.

The Substance Abuse and Mental Health Services (SAMHSA) Standard Framework for Levels of Integrated Healthcare describes each of these different models and levels of collaboration (e.g., minimal, basic, close).

- Level 1. Minimal collaboration: Behavioral health and primary care providers work in separate facilities, using separate systems, and rarely communicate about cases.
- Level 2. Basic collaboration at a distance: Behavioral health and primary care providers use separate systems at separate sites, but engage in periodic communication about shared patients, mostly through telephone and letters. Providers view each other as resources.
- Level 3. Basic collaboration on-site: Behavioral health and primary care providers have separate systems, but share facilities. Proximity supports at least occasional face-to-face meetings and communication improves and is more regular.
- Level 4. Close collaboration on-site: In part due to co-location in the same practice space, care is integrated through some shared systems. Face-to-face interactions occur regularly among primary care and behavioral health providers, treatment plans can be coordinated for difficult cases, and behavioral and primary care providers share a basic understanding of each other's roles and cultures of practice.
- Level 5. Close collaboration approaching an integrated practice: Behavioral health and primary care providers share the same sites, vision, and systems. All providers are on the same team and have developed an in-depth understanding of each other's roles and areas of expertise.
- Level 6. Full collaboration in a transformed/merged practice: Full collaboration occurs between providers. Providers and patients view the operation as a single health system treating the whole person.[12]

The elements of the six-level framework for integrated healthcare begin with collaboration focused on bringing resources together and continue through co-location in a physical office space, with increasing levels of integration in service framework and delivery.[12] This progression is visually depicted in **Figure 1**.

Although the model of care delivery is independent of the ability of technology to facilitate integration, the care delivery model often does affect the mechanisms and operations of integration and the opportunities specific technologies offer.

©2021 ECRI. All Rights Reserved.

Figure 1. Six Levels of Collaboration/Integration: Key Differences

COORDINATED		CO-LOCATED		INTEGRATED	
Level 1 Minimal Collaboration	Level 2 Basic Collaboration at a Distance	Level 3 Basic Collaboration On-Site	Level 4 Close Collaboration On-Site with Some System Integration	Level 5 Close Collaboration Approaching an Integrated Practice	Level 6 Full Collaboration in a Transformed/Merged Integrated Practice
Key Differentiator: Clinical Delivery					
▪ Screening and assessment done according to separate practice models ▪ Separate treatment plans ▪ Evidenced-based practices (EBPs) implemented separately	▪ Screening based on separate practices; information may be shared through formal requests or health information exchanges ▪ Separate treatment plans shared based on established relationships between specific providers ▪ Separate responsibility for care/EBPs	▪ May agree on specific screening or other criteria for more effective in-house referral ▪ Separate service plans with some shared information ▪ Some shared knowledge of each other's EBPs, especially for high utilizers	▪ Agree on specific screening, based on ability to respond to results ▪ Collaborative treatment planning for specific patients ▪ Some EBPs and some training shared, focused on interest or specific population needs	▪ Consistent set of agreed upon screenings across disciplines, which guide treatment interventions ▪ Collaborative treatment planning for all shared patients ▪ EBPs shared across system with some joint monitoring of health conditions for some patients	▪ Population-based medical and behavioral health screening is standard practice with results available to all and response protocols in place ▪ One treatment plan for all patients ▪ EBPs are team selected, trained, and implemented across disciplines as standard practice

Adapted from: Heath B, Wise Romero P, and Reynolds K. A Standard Framework for Levels of Integrated Healthcare. Washington, D.C. SAMHSA-HRSA Center for Integrated Health Solutions. March 2013. https://www.pcpcc.org/resource/standard-framework-levels-integrated-healthcare

Workgroup Process

Once EHRA and ECRI agreed to work together on a new safety project, various topics were suggested and a structured process was used to evaluate and prioritize these topics. Both organizations agreed that the goal was to bring together relevant data from multiple sources to inform strategies to address a high-priority safety issue. The key criteria used for evaluation included the following:

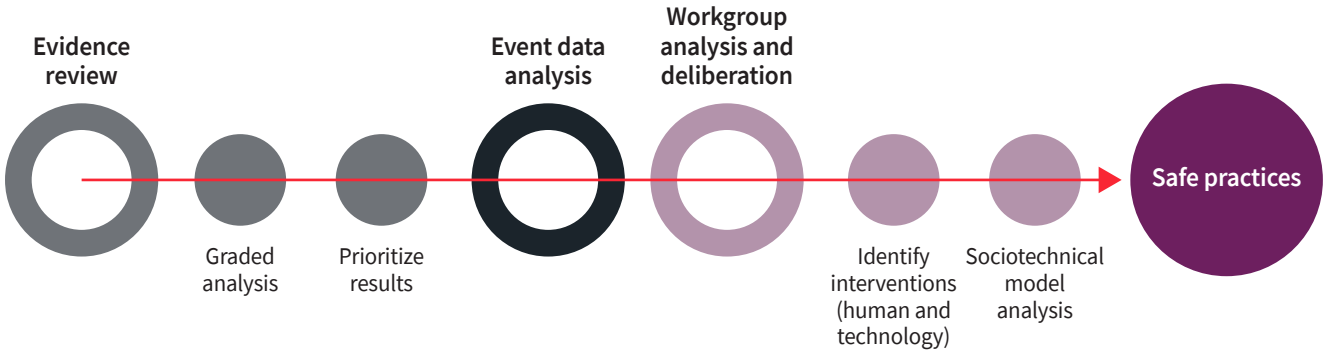
- The topic can be defined narrowly and precisely
- The issue is a demonstrated patient safety concern and desired outcomes will positively affect patient safety
- The matter is of national concern
- EHRA members and ECRI together can bring relevant data, analysis, and technology-enabled approaches to impact the issue
- Significant progress can be made in the first six months of the project
- EHR developers can implement the safe practice recommendations in the near-term (one to three years)

The fundamental model of workgroup activities is a proactive learning system, using an approach that is neither punitive nor regulatory.[13,14] EHRA and ECRI began by investigating and identifying the health IT-related issues that can determine the feasibility and effectiveness of integration of behavioral health and primary care. EHRA recruited a workgroup from among its members, including representatives from 15 different developer organizations. ECRI coordinated and led the workgroup efforts. Meetings were held in a virtual environment over a period of nine months, a time frame that had to be extended in part due to the impact of the coronavirus (COVID-19) pandemic.

The workgroup followed the established *Partnership*-developed workgroup process for issue evaluation (see **Figure 2**). Various resources, including SAMSHA's Framework for Levels of Integrated Healthcare,[12,15] the Health Insurance Portability and Accountability Act (HIPAA),[16] and 42 CFR Part 2 regulations,[17] provided important background information.

©2021 ECRI. All Rights Reserved.

Figure 2 . Process for Developing Health IT Safe Practice Recommendations



The *Partnership*'s workgroup process included evaluation of data from the ECRI and the Institute for Safe Medication Practices Patient Safety Organization, an evidence-based literature review, and most importantly, the deliberations of a joint EHRA/ECRI workgroup. Meetings included a mix of formal presentations, group discussions, online collaboration, and expert guest speakers.

These experts provided information from a risk management perspective, a clinician's view of the integrated care co-location model, and a look at the role that Health Level 7 (HL7®) standards and processes play in the current and the future state of the integration of behavioral health and primary care.

The workgroup focused on a three-pronged approach to technology-enhanced integration: (1) widely incorporating **screening** for behavioral health issues; (2) enabling clinician **documentation**; and (3) providing for **sharing** of information among clinicians, patients, and other authorized parties. The three prongs were further divided into the domains of **functionality**, **data elements/fields**, **integration**, and **measures** (see Figure 3). The information and learnings obtained from these various sources were used to develop safe practice recommendations and suggest strategies to execute them.

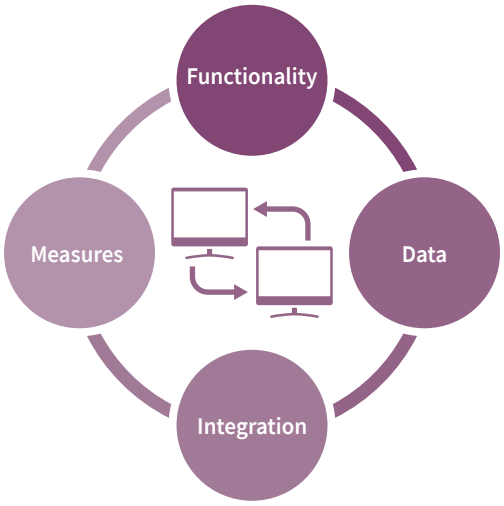
All workgroup participants had an opportunity to review, prioritize, and determine the feasibility of the proposed safe practice recommendations and strategies. This report includes action-oriented safe practice recommendations for EHR and health IT developers, clinicians and healthcare organizations, the government, and other stakeholders to facilitate their efforts to integrate behavioral health with primary care.

Data Analysis

To inform the project, ECRI obtained safety event data submitted to PSOs. Safety event reports are submitted to PSOs typically by clinicians and healthcare organizations, to facilitate shared learning. Events reported to PSOs are submitted under the protections provided to PSOs by the Patient Safety and Quality Improvement Act of 2005. The Patient Safety Act authorizes the Agency for Healthcare Research and Quality (AHRQ) to designate as PSOs entities that attest to having expertise in identifying the causes of and interventions to reduce the risk of and threats to the quality and safety of patient care.

Events reported between January 1, 2016, and November 30, 2019, were identified and examined to identify communication issues involving the treatment of behavioral health patients. A key word search of the following terms was initially used to identify safety events: psych, mental health (mh), substance use disorder (SUD), withdrawal, detox/intox, overdose, Clinical Institute Withdrawal Assessment for Alcohol (CIWA), one on one (not 1:1), suicide, behavioral health assessment/care plan, screening, mental/behavioral consult. Patient safety analysts reviewed events that involved the need to share electronic communications and documentation related to behavioral health patients and patients with SUDs in order to make care decisions.

Figure 3. Domains of Focus



©2021 ECRI. All Rights Reserved.

Analysts first developed a taxonomy to capture the broad category of communication issues affecting behavioral health and associated care. The taxonomy distinguishes events related to documentation of behavioral health and SUD cases and to the types of services provided. Analysts categorized events by the type of communication (e.g., internal communication—occurring within the same setting—and external communication—occurring outside or across settings) and by how the information was documented (e.g., free text, structured data) and shared (e.g., referrals, secure texts, through health information exchanges [HIEs]).

Events involved three types of patients, as depicted in **Figure 4**:

- Patients with behavioral health issues, 68% (n = 138/204)
- Patients with SUD, 26% (n = 53/204)
- Patients with both behavioral health issues and SUD, 6% (n = 13/204)

The extent to which these communications were internal or external, and where the safety issues arose, are depicted in **Figure 5**. Information is shared both internally and externally, with internal communications most frequently reported (83.3%; n = 170/204).

The safety events identified the reasons that data needed to be exchanged. These included data relevant for additional *screening* or assessments (32.4%; n = 66/204); information needed to complete *documentation* (13.7%; n = 28/204); and information needed for various *sharing* purposes (e.g., referrals, clinician communications) (54.4%; n = 111/204) (see **Figure 6**).

Data Limitations

The majority of the safety events analyzed were reported from acute care facilities. Some of these facilities have behavioral health units within their organizations. Only a small number of events were reported from facilities or practices that exclusively treat behavioral health patients.

At this time, AHRQ's Common Formats[18] do not have a behavioral health category for reporting of these events. The analysts gathered the information from the narrative descriptions in the event reports and used key word searches and natural language processing to identify these events.

Figure 4. Electronic Communication of Behavioral Health/Substance Use Disorder Documentation: Patient Type (n = 204)

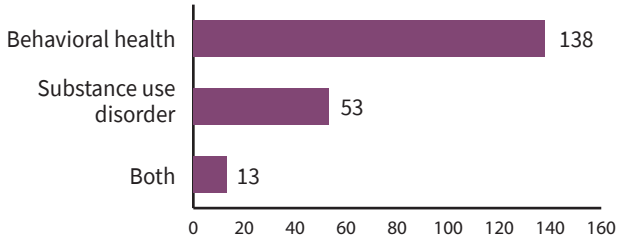


Figure 5. Electronic Communication of Behavioral Health/Substance Use Disorder Documentation: Communication Type (n = 204)

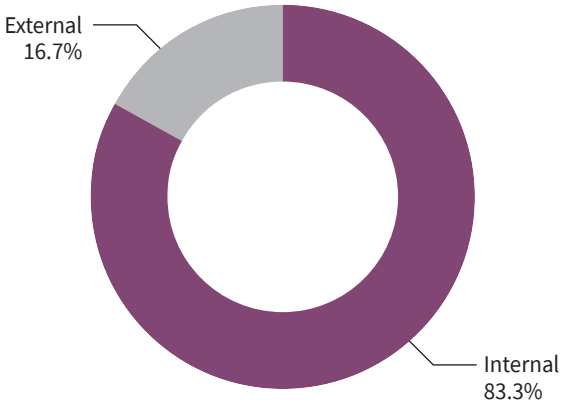
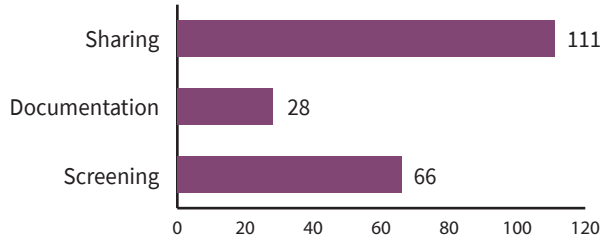


Figure 6. Electronic Communication of Behavioral Health/Substance Use Disorder Documentation: Documentation Type (n = 205*)



Note: Total adds up to more than 204 because more than one category can be chosen for an event.

©2021 ECRI. All Rights Reserved.

Literature Review Summary

A systematic review of the literature to inform the workgroup efforts was performed focusing on the following three questions:

- What validated screenings have providers used to identify behavioral health needs in primary care?
- What documentation elements are useful for integration of behavioral health and primary care?
- What elements facilitate interoperability between behavioral health and primary care?

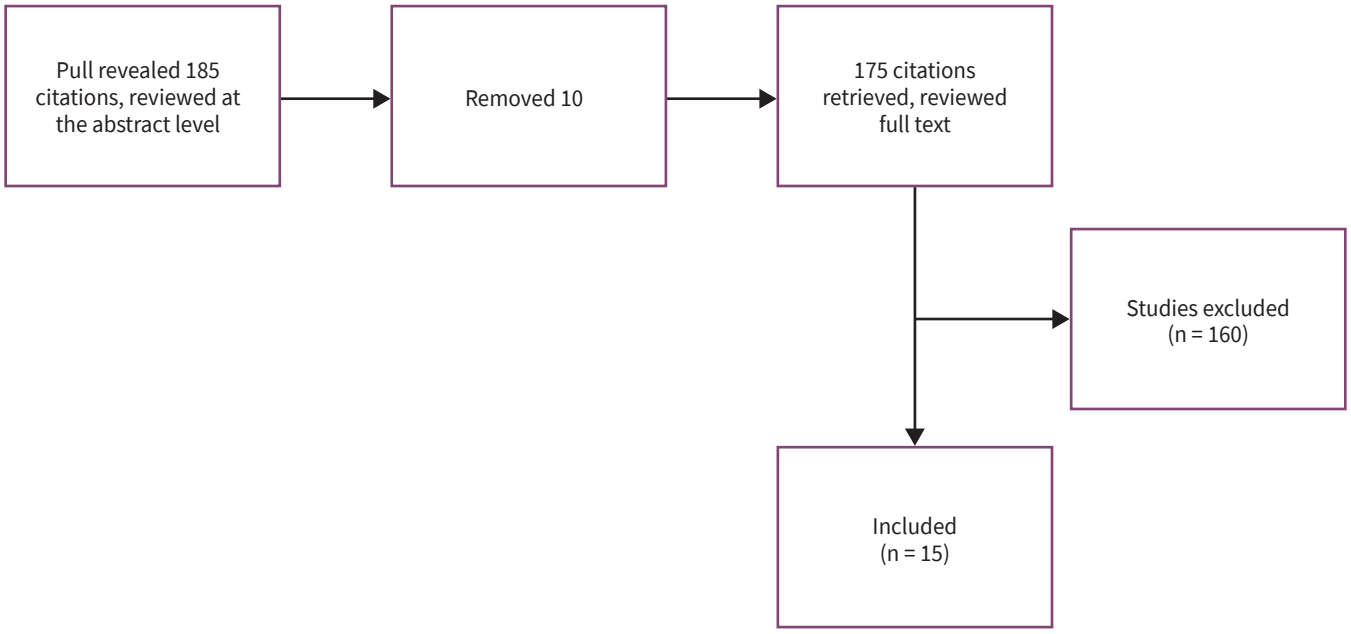
The literature search was conducted by masters-level medical librarians. A key word search of English-language studies published between January 1, 2012, and January 1, 2020, was conducted retrieving items from the Medline, PubMed, Embase, and CINAHL databases.

The initial key word search focused on the following terms: Addict, behavioral health, behavioural health, bipolar, computerised health record*, computerized health record*, computerised medical record*, Computerized medical record*, Depress*, EHR*, Electronic health record*, Electronic medical record*, Mental health, Mentally ill, Opiod*, Physician office, Physician practice*, Post-traumatic stress disorder, Primary care, PTSD, and Schizophreni*.

The literature search identified 15 articles addressing the key questions (see **Figure 7**). The majority of the studies revealed that when tools for screening for behavioral health issues are embedded in the EHR, screening rates increase, leading to the increased identification of patients with behavioral health needs.

The review also found that documentation should be simplified and standardized to support data extraction and information sharing. Documentation improvements can be accomplished through identification and implementation of data elements specific to behavioral health. Additional research is needed to determine how to improve the sharing and interoperability of information for behavioral health and primary care. Results from the literature review can be found in **Appendix A**.

Figure 7. Literature Review



©2021 ECRI. All Rights Reserved.

Recommendations

Screening

Ensure that validated, clinically accepted screening tools are integrated, easily accessible, and readily available in the EHR.

Enable triggers for CDS associated with screening tools to integrate behavioral health and primary care.

Documentation

Optimize documentation to support integration of behavioral health and primary care.

Sharing

Enable information sharing across care environments (within organizations, among clinicians in the same system, or across organizations and systems) and with portals, secure messaging, and HIEs.

Enable EHRs to use information in the record to segment patient information for exchange consistent with organizational policies, patient requests, and state and federal laws and regulations.

Discussion

The safe practice recommendations focus on technology's role in **screening**, **documentation**, and **sharing** of information to optimize the integration of behavioral health and primary care. The *Partnership*/EHRA workgroup synthesized the findings from the data analysis, the evidence-based literature review, and the workgroup's own deliberations to craft the recommendations.

The high-level recommendations addressing the three areas of screening, documentation, and sharing were refined by a focus on the domains of **functionality**, **data elements/fields**, **integration**, and **measures**. The recommendations create awareness, provide a framework, and take into account current technology and regulations as they identify strategies for current and future change. The full table of recommendations and strategies enabling their implementation can be found in **Appendix B**.

Through implementation of the identified safe practice recommendations, EHR developers have an opportunity to improve the integration of behavioral health and primary care by accomplishing the following:

- Designing, deploying, and implementing health IT strategies to optimize integration of behavioral health and primary care
- Working with clinicians and healthcare organizations to ensure that functionality is being used to its full potential
- Understanding functionality and processes that may still be needed
- Participating in policy and regulatory efforts to support interoperability, implementation of CDS, and other health IT priorities central to effective integration

Although the technologies needed are increasingly available, they are still not universally implemented or adopted in either behavioral health or primary care EHRs. For example, many organizations use a mix of paper and electronic tools (a hybrid approach) in conducting behavioral health screening. Behavioral health and primary care clinicians may also document information in different ways using different professional vocabularies, capturing information in different fields, or reporting the same data using different terminologies. Sharing information between behavioral health and primary care is often limited by available technology as well as by regulations and concerns about whether protected information will remain protected once shared.

The intent of the safe practice recommendations is to define how existing technology can be used to facilitate the integration of behavioral health with primary care. Then, with that understanding, the goal is to look at how stakeholders can build and expand on the existing functionality to improve the ability to integrate these disciplines in clinical practice. Finally, innovations in technology can incorporate new design, functions, formats, and terminology mapping to facilitate standardized documentation and quality and performance metrics.

©2021 ECRI. All Rights Reserved.

Appendix C follows a patient visit through multiple options of care, highlighting areas where technology can facilitate the three prongs of screening, documentation, and sharing. The "swim lanes" focus on each of these areas, along with a lane that reflects models to integrate care. Contained within the swim lanes are the steps associated with these three prongs. For example, screening is initiated at a visit, perhaps with a CDS prompt, then results are obtained, and then either further actions are taken or care is provided, or no additional actions are taken.

This same logic is applied to the other swim lanes. The processes related to each area are interrelated and all include opportunities for technology use (see Appendix C).

Taking a focused look at the algorithm (as seen in Figure 8), the setting (e.g., inpatient, outpatient) and the model for integration may vary, but the information needed or documented is the same although how the information is sent, viewed, or received may change.

These recommendations are applicable to all levels of integrated care (e.g., coordinated, co-located, integrated) and to all care settings (e.g., emergency department, inpatient, clinic), although specific organizational and technical approaches may vary. For example, recommendations related to sharing depend, in part, on the model of integration—enhanced collaboration, physical co-location, or full integration—and may require additional data elements, such as diagnosis or social determinants of health (SDoH).[19]

The safe practice recommendations for screening are listed in Appendix B and are discussed in the following sections.

Models for Integration

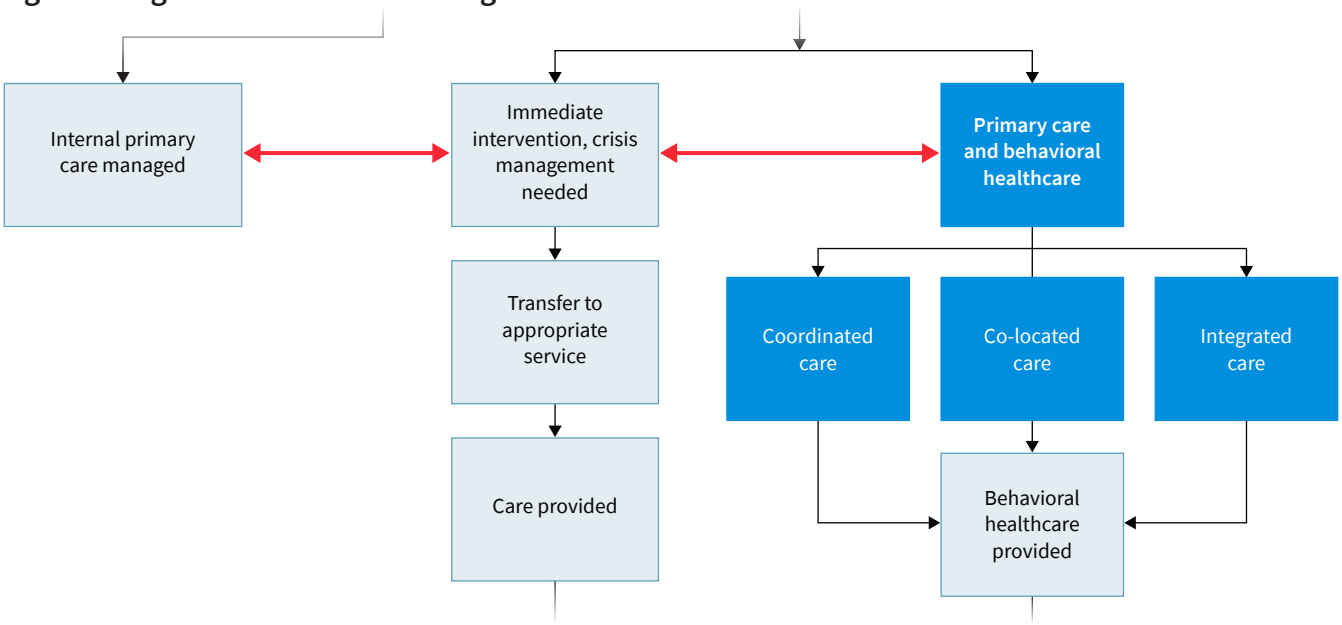
Behavioral health issue to be managed *internally* by the primary care provider; or

- May transition to next path during primary care management
- Immediate intervention or follow-up action needed
- Transfer to appropriate service

Behavioral health issue to be managed *collaboratively* by the primary care provider and behavioral health provider; or

- Coordinated care
- Co-located care
- Integrated care

Figure 8. Algorithim Models for Integration Swim Lane



©2021 ECRI. All Rights Reserved.

Screening

Ensure that validated, clinically accepted screening tools are integrated, easily accessible, and readily available in the EHR.

The first safe practice recommendation related to screening ensures that there is a way to readily access these tools using technology. The available validated screenings must be comprehensive for all patients and potential conditions, diagnoses (e.g., postpartum depression, SUD), and issues related to circumstances or recent medical care (e.g., surgery, COVID-19) (See **Appendix D**).

Streamlining the process for screening in the primary care setting, using validated, standardized screening tools, can increase the identification of patients in need of behavioral health services and recognition of their current state. By automating the screening process with tools that are easily accessible and readily available to behavioral health and primary care clinicians, it is possible to increase identification of appropriate care paths for patients with behavioral health needs. Using technology to remove the barriers associated with screening will make it easier and more efficient to provide care.[20-22]

Strategies to accomplish health IT-enabled and enhanced screening include the following:

- Identify validated screening tools, ensuring that they are incorporated into the workflow such that:
  - Screening tools are available for applicable conditions, problems, and diagnoses
  - It is easy for the patient to self-administer the screening tool or for the staff to assist in administration
  - Results can be tabulated for recognition of patients with behavioral health needs, follow-up treatment, referral to a behavioral clinician, and/or crisis management
  - Clinicians can document those results (either in the record, or across records in a sharing capacity)
  - Clinicians can share those results
  - Clinicians know that the screening was performed
  - Clinicians know the screening results
  - Clinicians can follow up with evidence-based actions based on the information from the screening
  - Clinicians can follow and track screening results over time
- Incorporate screening tools into EHRs with the functionality to embed or link to those tools using application programming interfaces (APIs) and apps or via a patient portal. Screening tools integrated into, or available through, the EHR must have the functionality to:
  - Display usable results for clinicians and healthcare organization to create awareness, acknowledgment, and action[23]
  - Facilitate collaboration and communication of the screening results among clinicians within and across health systems (e.g., to ensure follow-up by closing the loop)
  - Allow for internal and external reporting, including for clinical quality measures used by payers and healthcare organizations

Although some areas of practice have modified or created unique screening tools to accommodate specific needs or to address the cost of incorporation of such tools, using standard screening tools facilitates communication and sharing of assessments among providers. Choice of the appropriate tool for screening also considers the differing levels of integration and the diverse practice settings (e.g., inpatient care, ambulatory care, emergency department, telemedicine and virtual care). SDoH may also be incorporated into the process to inform screening tool use. Developers, clinicians, and healthcare organizations must be attuned to the costs and benefits of how these tools are implemented, incorporated, or accessed in or through the technology.

Integrating screening tools within the EHR may impose a significant economic burden on the clinician and the healthcare organization, including fees to license the tools. Screening tools must be economically feasible for vendors, healthcare organizations, and clinicians. Workgroup participants noted that licensing costs for many of the screening tools may be prohibitive and that even many behavioral-health-focused EHR products do not include a full complement of screening tools. Workgroup members suggested that identification of priority screening tools with potential governmental support or incentives will be needed to defray economic issues associated with screening tools.

©2021 ECRI. All Rights Reserved.

Enable triggers for CDS associated with screening tools to integrate behavioral health and primary care.

The second safe practice recommendation related to screening requires that the functionality associated with the standardized tools integrated in the EHR must enable triggers for CDS to support integrated behavioral health and primary care.

The various forms of CDS and their implementation continue to enhance evidence-based practice.[24] CDS systems can be used effectively in primary care practice to enable screening for behavioral health issues and remind providers to implement the screening. CDS can also inform follow-up recommendations based on screening results.[25] Implementation of the CDS interventions should be applied using the CDS "5 rights":[26]

- The right information
- The right person
- The right CDS intervention format
- Through the right channel
- At the right time in the workflow

Allowing links between screening tools and CDS helps to streamline workflow, more fully implement evidence-based care, and drive opportunities to use predictive analytics. Fully using technology allows for automated calculation of results and notifications for follow-up such as need for additional screening, treatment, or immediate interventions. This enhanced level of use is possible only when the basic requirements for triggering CDS are available in data elements gathered. The availability of this information is needed to trigger application of screening and follow-up based on guidelines or other information that informs the CDS (e.g., clinical preferences, external reporting requirements, regulations, and organizational policies).

Strategies to best incorporate CDS to inform screening include the following:

- Identifying the data elements needed to trigger screening and needed for follow-up based on guidelines, clinical preferences, external reporting requirements, regulations, and organizational policies using:
  - Relevant CDS for the appropriate patients
  - Minimum set of behavioral data elements (e.g., clinical, demographic, SDoH, administrative information)
- Using the data extracted from the EHR to trigger CDS and prompt clinical consideration:[27,28]
  - For recognition and identification of behavioral health needs
  - To enable predictive models to determine patterns and to predict potential future outcomes and trends
  - For accurate risk stratification of the severity of the illness to inform clinical decisions
  - For the full list of strategies and stakeholder actions for screening, see the safe practice recommendation in **Appendix B**.

Returning to the algorithm (**Appendix C**), it becomes clear that what is documented is essential for sharing across disciplines. This requires streamlining data entry and documentation. The goal is to facilitate interoperability (by identifying the same data elements), allowing for secure messaging among clinicians, and simplifying external and internal reporting needs. The safe practice recommendations for documentation are listed in **Appendix B** and are highlighted below.

Documentation

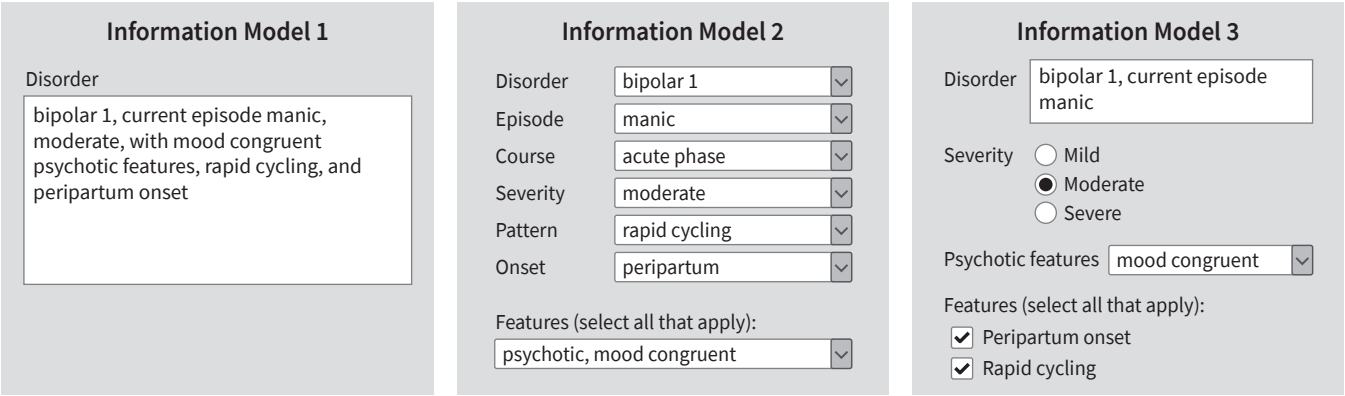
Optimize documentation to support integration of behavioral health and primary care.

The safe practice recommendation related to documentation is to optimize documentation to support the integration of behavioral health with primary care. In order to appropriately diagnose patients and treat and track the progress of care, clinicians need to communicate information through documentation. Clinical documentation in the EHR needs to be simplified and standardized if the processes of extracting and exporting clinical data are to become efficient and routine practices.[29] Clinicians may differ in how they document information or, depending on specialty, the detail in what they document, but documentation within the record is needed to enable communication of shared data to achieve the benefits of integrated clinical care.

The example in **Figure 9** demonstrates how the same information can be displayed differently among clinicians and across specialties and professions. The capture of this information in each of these displays impacts time of documentation, readability, and the ability to exchange the information contained in the capture.

©2021 ECRI. All Rights Reserved.

Figure 9. Behavioral Health Documentation Displays



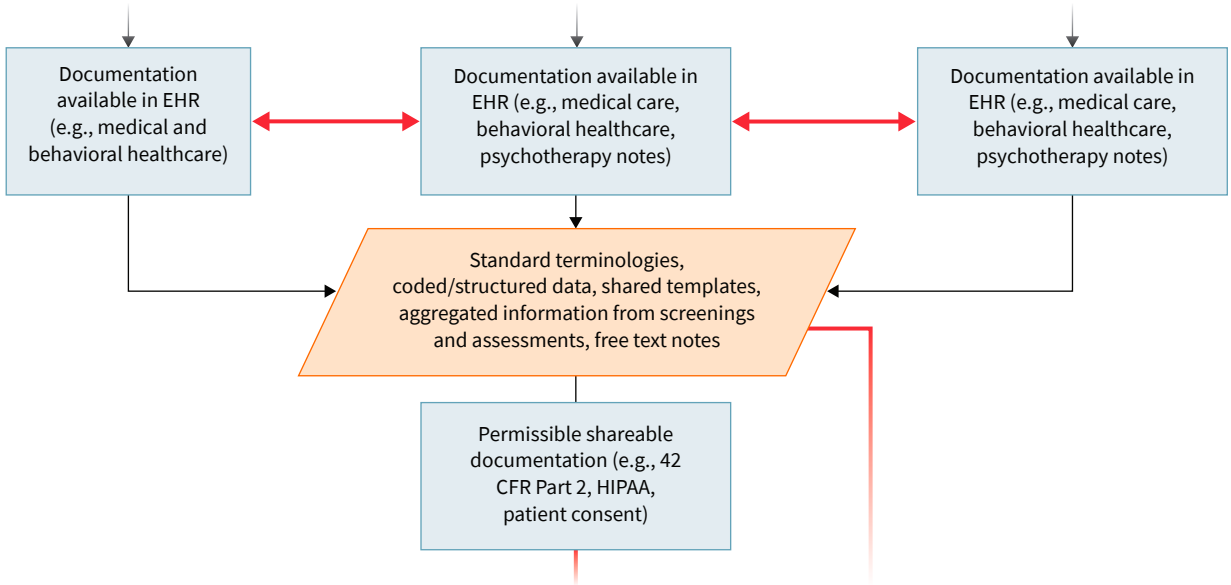
Source: Ranallo PA, Kilbourne AM, Whatley AS, Pincus HA. Behavioral health information technology: from chaos to clarity. Health Aff (Millwood). 2016;35(6). Used with permission.

The reliance of documentation for sharing is depicted in the algorithm detail in **Figure 10.** It is important to note the need for adequate documentation to support bidirectional sharing. The complete interrelationship of documented and shared information is depicted in **Appendix C**. The information contained in the parallelogram in **Figure 10** highlights what is needed for documentation to facilitate information sharing. The workgroup discussed various data elements necessary to optimize documentation for integrated care. These additional data elements include behavioral health diagnoses (e.g., from the *Diagnostic and Statistical Manual of Mental Disorders*, 5th ed. [DSM-5], the *International Classification of Diseases*, 10th ed. [ICD-10], *Current Procedural Terminology* [CPT]), SDoH, and family history of behavioral health diagnosis.

Strategies to execute the safe practice recommendation related to documentation include the following:

- Streamline behavioral health data entry:
  - For information sharing
  - To reduce variation
  - To standardize data elements needed for behavioral health, including the ability to incorporate free-text notes

Figure 10. Algorithm Documentation Swim Lane



EHR, electronic health record; HIPAA, Health Insurance Portability and Accountability Act.

©2021 ECRI. All Rights Reserved.

- Represent data directly or via mapping for:
  - Clinical documentation
  - Billing documentation
  - Reporting documentation (e.g., internal and external quality reporting, registry reporting)

Documentation strategies must also be able to incorporate results from assessments and screenings. Developing these types of standards will reduce variation in the documentation by assisting with:

- Uniform visualization of screening data
- Improving screening workflows
- Incorporating flow sheets in the EHR regardless of whether the information has been entered by clinicians, nonclinical staff, or the patient[30]

In order to identify data elements for incorporation, the workgroup looked at several common case scenarios where patient information was gathered and ultimately exchanged to facilitate care. These six case scenarios, identified with the three areas of data elements for exchange, are detailed in **Appendix E**. The case examples include (1) admission to or discharge from emergency services; (2) visit to the primary care provider; (3) transition between behavioral health and primary care; (4) coordination among behavioral health clinicians; (5) transition between psychiatric hospital and community care provider; and (6) coordination of care between non-behavioral health clinician and behavioral health clinician. The three areas of data elements include demographic information, clinical information, and administrative information.

EHRs are currently using United States Core Data for Interoperability (USCDI) version 1[31] for identified data elements. Suggestions for enabling the USCDI to capture additional data elements remain under discussion. Questions also arise as to whether SDoH should be included. Pairing clinical data with the patient's SDoH can positively affect a patient's overall health and health outcomes.[19] The complexity associated with SDoH is that they capture information that is used across multiple players in the healthcare and social services world. The use of SDoH information as a clinical and patient safety support tool is challenging because there is no simple way to communicate the information among individual clinicians.

The Gravity Project[32] is working to codify the SDoH so they can be more easily communicated across platforms for use in research and clinical support efforts. The identified coded data elements and associated value sets to represent the SDoH documented in EHRs address four clinical activities: screening, diagnosis, planning, and interventions. The project is focused on three social risk domains: food insecurity, housing instability and quality, and transportation access. The Gravity community is encouraged to submit new data elements and data classes for the USCDI draft version 2 through the Office of the National Coordinator for Health Information Technology (ONC) New Data Element and Class (ONDEC) submission system.[31] Enabling the technology to include SDoH will inform care and enable a more holistic view of what impacts health (see **Appendix E**). However, this does not mean that every aspect of SDoH must be captured in the USCDI even if it is being captured in the EHR. An additional challenge is identifying responsibilities for reacting to this newly captured information. Further research and comment are necessary to address these issues.

Technology's ability to incorporate data elements remains at various stages of development. The traffic light chart (red-yellow-green) in **Appendix F** identifies the present level of maturity of the various elements. **Appendix F** also identifies the current availability and the relevant technology standards that are used with this information. Green reflects elements that are in production and have high adoption (e.g., patient demographics). Yellow reflects items that may be in production and have medium or uncertain adoption (e.g., treatment plans). Finally, red shows areas (e.g., consent) that are in pilot or low-adoption states.

Appendix F includes information addressing the relevant technology standards. For example, the adoption of laboratory results using standards is yellow-light status, indicating more work needs to be done before the element reaches full maturity level or green-light status. The identified standards include HL7® and LOINC® (Logical Observation Identifiers Names and Codes). The yellow-light designation may be related to the inconsistent adoption of LOINC® across systems.

The functionality to support (directly or through mapping) documentation using standard vocabularies and code sets (e.g., LOINC®, SNOMED-CT® [Systematized Nomenclature of Medicine-Clinical Terms], ICD-10, DSM-5, and CPT), and to also incorporate free text, is needed in order to capture the essential elements for clinical data documentation. The importance of documentation is highlighted when seeking interoperable data for activities related to sharing, billing, and internal and external reporting requirements. Implementation of standard language and terminologies for capturing and tagging data elements and

©2021 ECRI. All Rights Reserved.

information in data fields is needed to assist in ensuring compliance for the protections imposed by 42 CFR Part 2 while at the same time enabling sharing and exchange between clinicians. Identifying and incorporating these functions for documentation elements so that they are compatible will contribute to the integration of behavioral health and primary care.

For the full list of strategies and stakeholder actions for documentation, see the safe practice recommendation tables in **Appendix B**.

Following the patient's journey as depicted in the algorithm (**Appendix C**) illustrates the interrelationship of screening, documentation, and sharing regardless of the model used to integrate care. The focus now turns to sharing (**Figure 11**, detail from the Algorithm in **Appendix B**). Information may need to be communicated or shared with patients, clinicians, HIEs, payers, or others. The information may be shared within the same location or organization or across multiple locations or organizations. The safe practice recommendations for sharing are listed in **Appendix B** and highlighted below.

Sharing

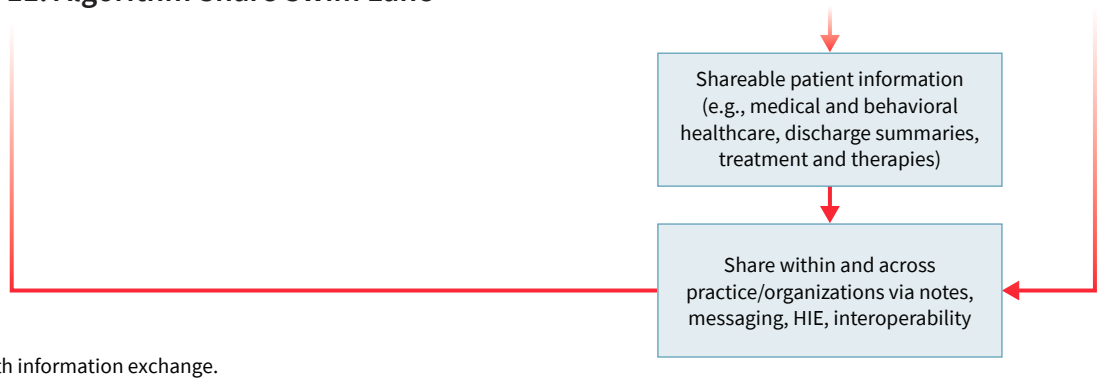
Enable information sharing across care environments (within organizations, among clinicians in the same system, or across organizations and systems) and with portals, secure messaging, and HIEs.

The first safe practice recommendation related to sharing is to enable information sharing across a variety of care environments. Based on the model of integration, information may be shared within or across systems. Although sharing of clinical information is similar across models, technology needs may differ based on the systems in place and the associated technical considerations. The bidirectional sharing of patient behavioral health information is an iterative process essential to support any of the models of integration. These technical considerations can define the mechanics of how regulations are implemented as well as how technologies are designed and implemented.

Data sharing capabilities should include clinical information at the granular level to support the various use cases seen in **Appendix E**.

- Identify sharing mechanisms within and across systems to facilitate the desired sharing between healthcare organization/clinician and healthcare organization/clinician
- Include the ability to segregate information as applicable to selected clinicians and other authorized parties in compliance with 42 CFR Part 2, using structured and encoded data
- Enhance health information infrastructure to support interoperability, usability, and information exchange[33]
- Enable information technologies supporting the sharing of clinical health information across systems using:
  - HL7® C-CDA® (Consolidated-Clinical Document Architecture)
  - HL7® FHIR® (Fast Healthcare Interoperability Resources)[34]
- Ensure the availability of clinically related data, ideally at the granular (i.e., subdocument, data-element) level, to support additional use cases such as:
  - Billing (e.g., insurance, workers' compensation)
  - Preauthorizations (e.g., medications, testing, therapies)
- Ensure data sharing capabilities to support quality measurement and other reporting (e.g., public health reporting)
- Ensure data capabilities for coordinating sharing of behavioral health and primary care data directly with patients and caregivers

Figure 11. Algorithm Share Swim Lane



HIE, health information exchange.

©2021 ECRI. All Rights Reserved.

Enable EHRs to use information in the record to segment patient information for exchange consistent with organizational policies, patient requests, and state and federal laws and regulations.

The second safe practice recommendation related to sharing is to enable the EHR to use technology for the segmentation of restricted patient information to facilitate the models of integration and allow for care coordination to improve quality, safety, and costs. Despite the clinical and safety benefits of sharing to facilitate enhanced integration, access by other clinicians to documentation created by behavioral health clinicians may be restricted by patient preferences, organizational policies and practices, federal and state laws, and technology configurations reflecting these policies and understanding of such laws. To achieve the sharing needed for integration, any barriers to data access should be intentional, well understood, and no more than needed to ensure regulatory compliance and respect patient preferences.[35]

EHRs should include data segmentation capabilities needed to support HIPAA, 42 CFR Part 2, and patient consent:

- EHRs should support separating behavioral health information in the medical record from HIPAA-defined psychotherapy notes that may be stored in the EHR system
- EHRs should support healthcare organization implementation of special protections for SUD treatment information (42 CFR Part 2)
  - Enable a non-Part 2 entity to segregate any specific SUD records received (either directly, or through another lawful holder) from a Part 2 program that is part of or external to the healthcare organization
- EHRs should enable a healthcare organization to identify units or individuals within the organization as Part 2 "programs" whose information requires segregation and other special protections

The U.S. Department of Health and Human Services has recognized these implementation challenges and encourages the use of health IT to help clinicians appropriately share sensitive information while complying with legal requirements and respecting patient privacy preferences.[36] Understanding the regulations and how to apply them in practice can be confusing. (See **Approaches to Privacy and Confidentiality**.)

Approaches to Privacy and Confidentiality

- Revise consent and authorization forms to incorporate instructions on restriction of sharing of behavioral health information among providers and other care team members (HIPAA, 42 CFR Part 2, state regulations).
- Ensure that psychotherapy process notes receive the additional protection they require. These records rarely need to be shared with the rest of the team. File them separately, and set in place special processes for team members to gain access.
- Ensure that information about SUD treatment receives the special protection it requires (42 CFR Part 2), but only when generated by SUD treatment facilities and programs that receive federal assistance.

HIPAA, Health Insurance Portability and Accountability Act; SUD, substance use disorder.

When sharing information, we may need to consider parties other than the sender and the receiver (or the patient or their authorized representative). Often, three types of players are involved: in addition to clinicians or healthcare organizations, an HIE may be involved. Each of these entities must have safety mechanisms in place to protect information that is restricted by patient consent or under HIPAA and 42 CFR Part 2 (see **Checklist to Safely Share Behavioral and Physical Health Information for Models of Integration**).

During the workgroup deliberations, participants highlighted the fact that, although robust standards for interoperability exist (e.g., HL7® version 2, CDA®, and FHIR®), the existence of standards is not enough to effectively and securely share data across healthcare systems. We also need implementation guides to apply the standards to specific use cases. Implementation guides, many of which are already in wide use, will help to successfully integrate behavioral health and primary care using health IT.

Each of the safe practice recommendations includes actions for measurement. Measurement is essential to optimizing health IT for the integration of behavioral health and primary care. Measures offer insight into the performance of the technology, help identify areas for improvement, and increase transparency.

©2021 ECRI. All Rights Reserved.

Checklist to Safely Share Behavioral and Physical Health Information for Models of Integration

- Can the information be shared while providing the necessary protection required under HIPAA and 42 CFR Part 2?
- Has the appropriate consent been given and applied?
- Does the communication electronically tag the health information to indicate privacy considerations, including legal requirements, within a patient record or summary-of-care document within the EHR?
- Are the tags on data elements, segments, or whole documents used by automated-access control solutions to prevent unauthorized access to patient data?
- Is there enough information in a computable fashion that the receiver is aware of the special considerations for handling the information received?

EHR, electronic health record; HIPAA, Health Insurance Portability and Accountability Act.

Source: Strategy on reducing regulatory and administrative burden relating to the use of health IT and EHRs [draft for public comment]. Washington (DC): Office of the National Coordinator for Health Information Technology (ONC); 2018 Nov. 74 p. Also available: https://www.healthit.gov/topic/usability-and-provider-burden/strategy-reducing-burden-relating-use-health-it-and-ehrs

The integration of behavioral health and primary care using technology is challenging because of barriers such as usability and interoperability. Health IT helps users gather data that can be used to optimize integration of behavioral health and primary care, such as results of behavioral health screening. Key issues to address include whether we are able to appropriately recognize patients in need of behavioral health services and document that information in a way that all clinicians treating the patient can readily view and access it. The ability to measure requires that the needed functionality, data elements, and information are available for the calculation of measures needed for both external and internal reporting requirements.

Measures by Prong

Developer support for integration should include functionality for existing behavioral health quality measures and collaboration with the clinicians and the healthcare organization to encourage the adoption and inclusion of additional electronic clinical quality measures for behavioral health. Measures empower the developers and both the behavioral and the primary care clinicians to assess the quality and results of their current technology and workflow processes and prioritize improvements.[37]

Screening

Are the computable data elements available for screening?

Do the screening data elements align with the external and internal requirements of the healthcare organization?

- Compliance for screening tools
- Appropriateness of CDS alerts

Documentation

Is the functionality to use computable data to complete measures/measurement provided?

- Available documentation elements
  - Screening
  - Follow-up plan or referral
- Elements needed for reporting measures (e.g., clinical quality measures, National Quality Forum measures)

Sharing

Are the correct data elements available to support interoperability?

Are the correct data elements available to measure the adequacy of the C-CDA®?

Learnings

It is feasible for technology to play a role in integrating behavioral health and primary care. As developers, healthcare organizations, and clinicians face an uncertain future related to COVID-19, new regulations, limited resources, and an increase in telehealth visits, the need to integrate behavioral health with primary care is even more important. The COVID-19 pandemic finds three times as many Americans meeting the criteria for depression as previously. Coordinating and integrating care using all available technologies to meet clinician and patient needs highlights the importance of practices for screening, documentation, and sharing.[38]

Implementing these safe practice recommendations will help to lay the foundation for interoperable optimization of integrated behavioral healthcare with primary care. Beginning

©2021 ECRI. All Rights Reserved.

with screening, these recommendations build on one another. Regardless of the care setting, screening tools must be integrated in the EHR to align the clinical and electronic workflows, including documentation, to improve efficiency and minimize clinician burden. The results that are captured from screening should be readily available, easily visible, and shareable (while complying with legal requirements and respecting patient privacy preferences) in order to maximize their use. Integrated care relies on the ability to share information appropriately within organizations, across organizations, and among clinicians. Optimizing health IT for the safe integration of behavioral health and primary care is a shared responsibility.

EHR developers can create tools and improve usability to realize these goals. Collaboration with end users, researchers, and regulators will add value and fill the gaps that currently impede improvements to patient care.

Conclusion

Health IT developers have a central role to play in supporting the integration of behavioral health and primary care, especially in regard to the three prongs previously discussed: screening, documentation, and sharing. Fulfilling this opportunity is, however, challenging for a variety of reasons, including regulatory requirements and complexity; uneven progress in standards and their implementation; the variability in models of integration; and heterogeneity (e.g., in use of EHRs, professional terminologies, and clinical philosophies) across relevant clinical professions, care settings, and models of integration. Fundamentally, however, health IT can and does play a vital role in the integration of care and its usefulness and fundamental opportunities are not unique to or focused on particular care settings or models of integration.

Meeting these challenges and realizing these opportunities will require that EHR developers collaborate with clinicians, healthcare delivery organizations, regulators, standards development organizations, and policy makers. So, although developers do face challenges in designing and adapting technologies to support integration, the involvement of and support from the three prongs of screening, documentation, and sharing hold great promise to advance technology-enabled integration of primary care and behavioral health. In particular, although the health IT strategies emphasized by the safe practice recommendations detailed here are targeted at EHR developers, realizing the benefits of integration for safe, high-quality patient care depends not only on technology but also on the decisions and actions of clinicians in using the various prongs to enable integrated care. The steps taken by both developers and clinicians will, in turn, be greatly affected by the work and decisions of healthcare organizations, policy makers, and those who develop and implement standards. Just as collaboration is central to effective models of clinical integration, it is likewise essential to realizing the value of health IT in supporting clinical integration.

©2021 ECRI. All Rights Reserved.

References

1. Price-Haywood EG, Dunn-Lombard D, Harden-Barrios J, et al. Collaborative depression care in a safety net medical home: facilitators and barriers to quality improvement. Popul Health Manag. 2016 Feb;19(1):46-55. Also available: https://dx.doi.org/10.1089/pop.2015.0016. PMID: 26087153.
2. Institute of Medicine, Committee on Quality of Health Care in America. Corrigan JM, et al, editor(s). Crossing the quality chasm: a new health system for the 21st century. Washington (DC): National Academy Press; 2001. 337 p. Also available: http://search.nap.edu/books/0309072808/html/.
3. Staeheli M, Aseltine RH, Schilling E, et al. Using mHealth technologies to improve the identification of behavioral health problems in urban primary care settings. SAGE Open Med. 2017 Jun;5:1-8. Also available: http://dx.doi.org/10.1177/2050312117712656. PMID: 28634539.
4. FDASIA Health IT Report: proposed strategy and recommendations for a risk-based framework. Silver Spring (MD): U.S. Food and Drug Administration (FDA); 2014 Apr. 34 p. Also available: https://www.fda.gov/AboutFDA/CentersOffices/OfficeofMedicalProductsandTobacco/CDRH/CDRHReports/ucm390588.htm.
5. IOM (Institute of Medicine). Health IT and patient safety: building safer systems for better care. Washington (DC): The National Academies Press; 2012. 211 p. Also available: http://www.nationalacademies.org/hmd/Reports/2011/Health-IT-and-Patient-Safety-Building-Safer-Systems-for-Better-Care.aspx.
6. Graber ML, Johnston D, Bailey R. Report of the evidence on health IT safety and interventions (Prepared by RTI International, Research Triangle Park, NC). Washington (DC): US Department of Health and Human Services; 2016 May. 50 p. Also available: https://www.healthit.gov/sites/default/files/task_8_1_final_508.pdf.
7. Binzer P, Marchibroda J, Solomon R, et al. (Alliance for Quality Improvement and Patient Safety, Health Innovation Initiative Bipartisan Policy Center, ECRI Institute, Pew Charitable Trusts). Letter to Agency for Healthcare Research and Quality (AHRQ) and the Office of the National Coordinator for Health Information Technology (ONC) re: shared vision for a national health IT safety collaborative. 2018 Mar 14. 2 p.
8. The Academy for Integrating Behavioral Health and Primary Care. What is integrated behavioral health?. [internet]. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); 2020 [accessed 2020 Oct 13]. [2 p]. Available: https://integrationacademy.ahrq.gov/about/integrated-behavioral-health.
9. Woodson TT, Gunn R, Clark KD, et al. Designing health information technology tools for behavioral health clinicians integrated within a primary care team. J Innov Health Inform. 2018 Oct 31;25(3):158-68. Also available: https://dx.doi.org/10.14236/jhi.v25i3.998. PMID: 30398459.
10. Jetelina KK, Woodson TT, Gunn R, et al. Evaluation of an electronic health record (EHR) tool for integrated behavioral health in primary care. J Am Board Fam Med. 2018 Sep-Oct;31(5):712-23. Also available: https://dx.doi.org/10.3122/jabfm.2018.05.180041. PMID: 30201667.
11. EHR code of conduct. [internet]. Chicago (IL): Electronic Health Record Association; [accessed 2018 Sep 19]. [4 p]. Available: https://www.ehra.org/resource-library/ehr-code-conduct.
12. Heath B, Wise Romero P, Reynolds K. A review and proposed standard framework for levels of integrated healthcare. Washington (DC): SAMHSA-HRSA Center for Integrated Health Solutions; 2013 Mar. 13 p. Also available: https://nchcnh.org/images/NCHCuplds/A_Standard_Framework_for_Levels_.pdf.
13. Bittles AH, Grant JC, Sullivan SG, et al. Does inbreeding lead to decreased human fertility? Ann Hum Biol. 2002 Mar-Apr;29(2):111-30. PMID: 11874619.
14. Learning health systems. [internet]. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); 2017 Nov [accessed 2018 Sep 19]. [5 p]. Available: https://www.ahrq.gov/professionals/systems/learning-health-systems/index.html.
15. Heath B, Romero P, Reynolds K. A standard framework for levels of integrated healthcare. Washington (DC): SAMHSA-HRSA Center for Integrated Health Solutions; 2013 Mar. 13 p. Also available: https://www.pcpcc.org/resource/standard-framework-levels-integrated-healthcare.
16. Modifications to the HIPAA Privacy, Security, Enforcement, and Breach Notification Rules Under the Health Information Technology for Economic and Clinical Health Act and the Genetic Information Nondiscrimination Act; Other Modifications to the HIPAA Rules. 45 CFR Parts 160 and 164. Fed Regist. 2013 Jan 25;78(17):5566-702. Also available: https://www.govinfo.gov/content/pkg/FR-2013-01-25/pdf/2013-01073.pdf.
17. Confidentiality of substance use disorder patient records. Fed Regist. 2020 Aug 14;85(136):42986-3039. Also available: https://www.federalregister.gov/documents/2020/07/15/2020-14675/confidentiality-of-substance-use-disorder-patient-records.
18. AHRQ Patient Safety Organization Program: common formats. [internet]. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); [accessed 2020 Sep 15]. [4 p]. Available: https://pso.ahrq.gov/common.
19. Morton A, Taylor A, Meklir S, Barker W. Advancing interoperable social determinants of health data. [internet]. Washington (DC): The Office of the National Coordinator for Health Information Technology (ONC); 2019 Dec 12 [accessed 2020 Oct 13]. [1 p]. Available: https://www.healthit.gov/buzz-blog/interoperability/advancing-interoperable-social-determinants-of-health-data.
20. Frick MG, Butler SA, deBoer DS. Universal suicide screening in college primary care. J Am Coll Health. 2019 Aug 5;1:1-6. Also available: https://dx.doi.org/10.1080/07448481.2019.1645677. PMID: 31381487.
21. Sudhanthar S, Thakur K, Sigal Y, et al. Improving validated depression screen among adolescent population in primary care practice using electronic health records (EHR). BMJ Qual Improv Rep. 2015 Oct 21;4(1):u209517. Also available: https://dx.doi.org/10.1136/bmjquality.u209517.w3913. PMID: 26734415.
22. Bajracharya P, Summers L, Amatya AK, et al. Implementation of a depression screening protocol and tools to improve screening for depression in patients with diabetes in the primary care setting. J Nurse Pract. 2016 Nov-Dec;12(10):690-7. Also available: http://dx.doi.org/10.1016/j.nurpra.2016.08.009.
23. Wiklund ME, Kendler J, Hockberg L, et al. Technical basis for user interface design of health IT. (Prepared by: Vanderbilt University Medical Center

©2021 ECRI. All Rights Reserved.

under Contract No. SB1341-11-CN-0011). Publication No.: NIST GCR 15-996. Gaithersburg (MD): National Institute of Standards and Technology, U.S. Department of Commerce; 2015 Sep. 192 p. Also available: https://nvlpubs.nist.gov/nistpubs/gcr/2015/NIST.GCR.15-996.pdf.

24. Khorasani R, Hentel K, Darer J, et al. Ten commandments for effective clinical decision support for imaging: enabling evidence-based practice to improve quality and reduce waste. AJR Am J Roentgenol. 2014 Nov;203(5):945-51. Also available: http://dx.doi.org/10.2214/AJR.14.13134. PMID: 25341131.
25. Etter DJ, McCord A, Ouyang F, et al. Suicide screening in primary care: use of an electronic screener to assess suicidality and improve provider follow-up for adolescents. J Adolesc Health. 2018 Feb;62(2):191-7. Also available: http://dx.doi.org/10.1016/j.jadohealth.2017.08.026. PMID: 29195764.
26. Osheroff J, Pifer E, Teich J, et al. Overview of CDS five rights. (Chapter 1, Section 2). Improving outcomes with clinical decision support: an implementer's guide. 1st ed. New York (NY): Productivity Press; 2005. Also available: https://digital.ahrq.gov/ahrq-funded-projects/current-health-it-priorities/clinical-decision-support-cds/chapter-1-approaching-clinical-decision/section-2-overview-cds-five-rights.
27. Raney L, Bergman D, Torous J, et al. Digitally driven integrated primary care and behavioral health: how technology can expand access to effective treatment. Curr Psychiatry Rep. 2017 Sep 30;19(11):86. Also available: http://dx.doi.org/10.1007/s11920-017-0838-y. PMID: 28965319.
28. Simon GE, Johnson E, Lawrence JM, et al. Predicting suicide attempts and suicide deaths following outpatient visits using electronic health records. Am J Psychiatry. 2018 Oct;175(10):951-60. Also available: https://dx.doi.org/10.1176/appi.ajp.2018.17101167. PMID: 29792051.
29. Kobus AM, Harman JS, Do HD, et al. Challenges to depression care documentation in an EHR. Fam Med. 2013 Apr;45(4):268-71. https://www.stfm.org/familymedicine/vol45issue4/Kobus268. PMID: 23553091.
30. Aleem S, Torrey WC, Duncan MS, et al. Depression screening optimization in an academic rural setting. Int J Health Care Qual Assur. 2015;28(7):709-25. Also available: http://dx.doi.org/10.1108/IJHCQA-01-2015-0012. PMID: 26241092.
31. United States Core Data for Interoperability (USCDI). [internet]. Washington (DC): Office of the National Coordinator for Health Information Technology (ONC); [accessed 2020 Oct 16]. [6 p]. Available: https://www.healthit.gov/isa/united-states-core-data-interoperability-uscdi.
32. HL7 Gravity project. [internet]. Ann Arbor (MI): Health Level Seven International; [accessed 2020 Oct 23]. [6 p]. Available: http://www.hl7.org/gravity/.
33. Madden JM, Lakoma MD, Rusinak D, et al. Missing clinical and behavioral health data in a large electronic health record (EHR) system. J Am Med Inform Assoc. 2016 Nov;23(6):1143-9. Also available: https://dx.doi.org/10.1093/jamia/ocw021. PMID: 27079506.
34. Ranallo PA, Kilbourne AM, Whatley AS, et al. Behavioral health information technology: from chaos to clarity. Health Aff (Millwood). 2016 Jun;35(6):1106-13. Also available: http://dx.doi.org/10.1377/hlthaff.2016.0013. PMID: 27269029.
35. Segal MJ. Using technology to facilitate the integration of behavioral health with primary care: the importance of data sharing. [internet]. Plymouth Meeting (PA): ECRI; 2020 Aug 5 [accessed 2020 Oct 23]. Available: https://blog.ecri.org/technology-facilitate-integration-behavioral-health-primary-care.
36. Strategy on reducing regulatory and administrative burden relating to the use of health IT and EHRs [draft for public comment]. Washington (DC): Office of the National Coordinator for Health Information Technology (ONC); 2018 Nov. 74 p. Also available: https://www.healthit.gov/topic/usability-and-provider-burden/strategy-reducing-burden-relating-use-health-it-and-ehrs.
37. HealthIT.gov. Clinical quality and safety. Measure results. [internet]. Washington (DC): Office of the National Coordinator for Health Information Technology (ONC); 2020 [accessed 2020 Oct 13]. [4 p]. Available: https://www.healthit.gov/topic/clincal-quality-and-safety/measure-results.
38. Ettman CK, Abdalla SM, Cohen GH, et al. Prevalence of depression symptoms in US adults before and during the COVID-19 pandemic. JAMA Netw Open. 2020 Sep 1;3(9):e2019686. Also available: http://dx.doi.org/10.1001/jamanetworkopen.2020.19686. PMID: 32876685.

©2021 ECRI. All Rights Reserved.

Appendix A. Literature Review

Executive Summary

Behavioral health disorders remain underrecognized and underdiagnosed. The World Health Organization and the United States Surgeon General have called for the integration of behavioral health treatment into primary care to address the treatment gap for the estimated 50% of behavioral health conditions that go undiagnosed each year.[1] Primary care settings have become a gateway to care for many individuals with behavioral health needs. Although depression is among the most common chronic conditions encountered in the primary care setting, one in four adults in the United States has a diagnosable behavioral health condition that may be unrecognized or untreated.[1]

In 2013, ECRI convened the *Partnership for Health IT Patient Safety*, and various component, single-topic-focused workgroups followed. For this subject, Optimizing Health IT for Safe Integration of Behavioral Health and Primary Care, the workgroup included members from HIMSS Electronic Heath Record Association (EHRA). The project was oriented towards exploring how health information technology (IT) could optimize screening, documentation, and sharing to facilitate the integration of behavioral health and primary care.

To inform the workgroup's efforts, a literature review was performed to investigate the use of technology in the integration of behavioral health and primary care. The use of technology is rapidly changing the healthcare landscape, as seen during the coronavirus (COVID-19) pandemic. The need to screen, and to document and share behavioral health and substance use disorder (SUD) information in an easily visible and readily accessible manner, became apparent. Telehealth has seen an upswing, particularly for behavioral health, with a rapid switch from face-to-face, in-person visits to virtual visits. The critical challenge is to optimize technology to integrate behavioral health and primary care as we pivot to telehealth, while we simultaneously face a shortage of behavioral health providers and an increase in patients with behavioral health needs. The challenge is clear for developers, healthcare organizations, and clinicians.

The literature review addressed the following key questions:

1. What validated screenings have providers used to identify behavioral health needs in primary care?
2. What documentation elements are useful for integration of behavioral health and primary care?
3. What elements facilitate interoperability between behavioral health and primary care?

Background

The integration of behavioral health with primary care can be accomplished using any of several integrated care models, ranging from a solo primary care practice that uses behavioral health services as a resource (e.g., for referrals, consultations) to a fully integrated model in which the behavioral health and the primary care clinicians are in the same setting utilizing the same information systems. Regardless of which model is used, integrated care requires identifying patients who need behavioral services through screening, improved documentation that is easily viewable, and information that can be shared within and across systems.

Studies have addressed investigation, quality improvement projects, and recommendations for integration of behavioral health and primary care. Most studies have focused on improving screening rates. None of the articles revealed in our literature search addressed the impact of screening, documentation, or sharing of information on clinical outcomes. As part of the work conducted by the ECRI-convened *Partnership for Health IT Patient Safety*, EHRA and the *Partnership* collaborators sought to advance strategies to optimize the use of health IT for the safe integration of behavioral health and primary care.

Methods

The *Partnership*'s literature review was conducted with the help of a literature search by master's-level medical librarians. A search of English-language studies published between January 1, 2010, and January 1, 2020, using a keyword search was conducted using the Medline, PubMed, Embase, and CINAHL databases. The initial keyword search focused on the following terms: Addict, behavioral health, behavioural health, bipolar, computerised health record*, computerized health record*, computerised medical record*, Computerized medical record*, Depress*, EHR*, Electronic health record*, Electronic medical record*, Mental health, Mentally ill, Opiod*, Physician office, Physician practice*, Post-traumatic stress disorder, Primary care, PTSD, and Schizophreni*.

This search yielded 185 citations. All titles and abstracts were screened by a master's-level clinical analyst. Six duplicates were

©2021 ECRI. All Rights Reserved.

removed as well as studies prior to January 2012 and those performed outside the United States. A total of 175 citations were then reviewed at the full-text level, with a focus on screening, documentation, and sharing. The reviewer was tasked with full-text review and evaluation, determining the type of study, identifying study design (population, location), and assessing whether an article met the inclusion criteria and addressed the three key questions.

From here, the search was further refined using the key questions listed above. This reduced the number of search results to 15 records.

For key question 1, the majority of the literature addressing screening focused on more efficient workflows to increase screening rates and reduce burden. In all of the studies, screening rates were increased as a result of more efficient workflows; however, important clinical outcomes were not measured. One study found that incorporating adolescent suicide screening and provider follow-up guidance into existing computer decision support in primary care was feasible and well utilized by providers.[2]

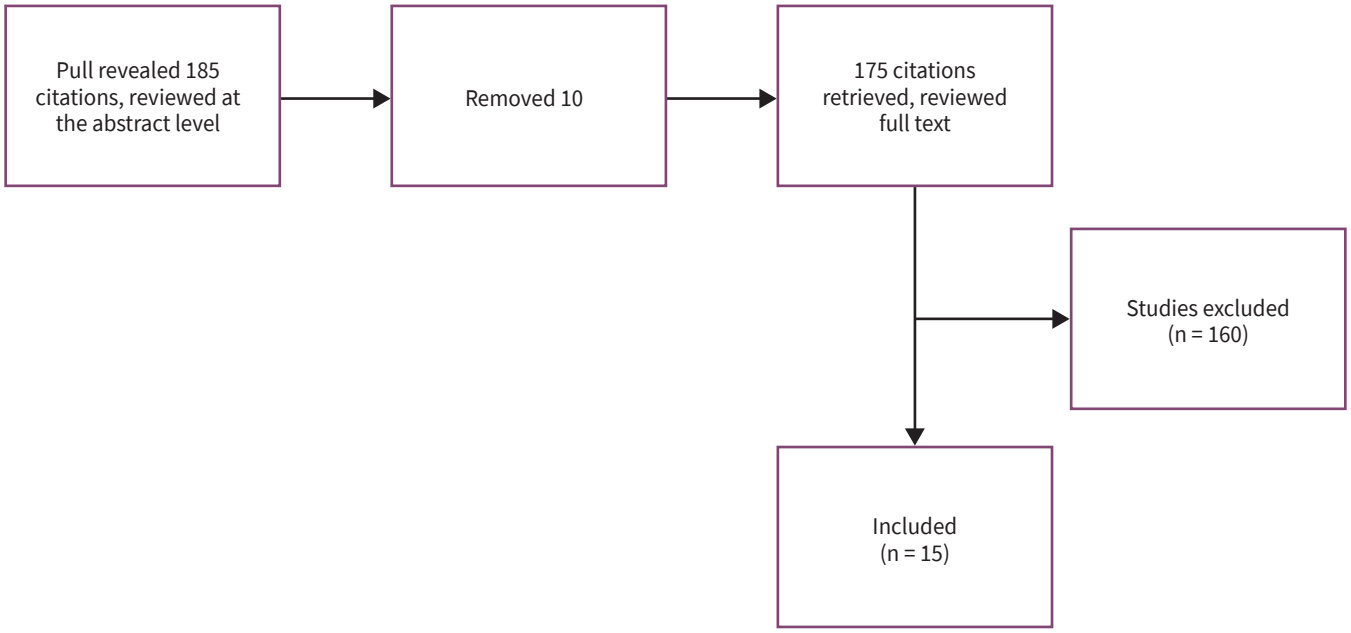
Overscreening can pose as much of a problem and burden as underscreening. One study demonstrated that a reduction in depression screening due to overprocessing can be accomplished by adopting a single screening instrument. A single screening instrument helped to reduce the defects in the process by making sure most patients seen in primary care were screened with a validated instrument while making adjustments to reduce unnecessary, duplicate, or overfrequent screening.[3]

For key question 2, the search identified a few studies that addressed documentation using data elements. According to one study, the inclusion of consensus-based common data elements will enhance the potential for SUD treatment. Integrated with other medical care in primary care settings, the inclusion of these data elements will support the adoption of Office of the National Coordinator for Health Information Technology (ONC)-certified EHRs containing SUD-relevant common data elements that may become eligible for Centers for Medicare and Medicaid Services reimbursement.[4]

For key question 3, one study addressed interoperability as a significant challenge.[5,6] Lack of interoperability often results in workarounds such as double documentation and duplicate data entry, printing. and scanning; free-standing tracking systems; and/or reliance on patient or clinical recall for inaccessible clinical information.[5] Another study set forth key recommendations to establish a minimum (i.e., core) data set for documentation as a standard to support interoperability.[6]

See **Evidence Tables** for the 15 studies and articles included in the literature review.

Figure. Literature Review



©2021 ECRI. All Rights Reserved.

Conclusion

As with any new health IT implementation efforts, the integration of behavioral health and primary care can further burden clinicians and EHRs. Vendors, in cooperation with clinicians, should design EHR products that support integrated care delivery functions regardless of the setting or integrated care model. They should include embedded and/or linked screening tools; documentation that includes shared care plans; template-driven documentation for common behavioral health conditions such as depression; and use of identified data elements and standards for improved functionality for sharing and interoperability.

More research is needed on the effectiveness of the recommended interventions. Additional evaluation should assess the implementation of screening tools, data elements, and sharing of information within and across systems. These actions will serve as a way to increase screening rates, identify patient needs, improve documentation, facilitate sharing of information, and improve clinical outcomes.

Using health IT to optimize the safe integration of behavioral health and primary care will require financial support and cooperative efforts among clinicians, EHR vendors, practice assistance organizations, regulators, standards setters, and workforce educators.[5]

©2021 ECRI. All Rights Reserved.

Evidence Tables

Study Details	Patients/Study Methods	Intervention/Treatment	Outcomes/Results
— What validated screenings have providers used to identify behavioral health needs in primary care? — What documentation elements are useful to the integration of behavioral health and primary care? — What elements facilitate interoperability between behavioral health and primary care?			
Reference: Cifuentes et al. (2015)[5] **Study design:** Observational, cross-case comparative study **Purpose:** To describe the EHR-related experiences of practices striving to integrate behavioral health and primary care using tailored, evidence-based strategies	**Health IT:** Solutions to integrate behavioral health and primary care **Setting:** 8 primary care clinics and 3 community health centers participating in Advancing Care Together (ACT), an initiative funded by the Colorado Health Foundation **Participants:** 11 practices **Study period:** 2012–2014 **Study methods:** A multidisciplinary team used a grounded theory approach to analyze program documents, field notes from practice observation visits, online diaries, and semi structured interviews to collect qualitative and quantitative data.	**Intervention:** Use of existing EHR systems to deliver integrated care and the challenges, workarounds, and movement toward health HIT solutions to emerge during the process **Outcome:** Analysis of each case to include the tagging of text segments to identify passages that emerged as an important area of experience for practices	**Outcomes:** **3 EHR challenges identified** 1. New types of providers were hired to support the integrated care model; they generated data not previously documented or tracked by existing EHR systems 2. Integrated teams had specific communication and care coordination needs, such as use of shared care plans to coordinate tasks for patients receiving integrated care services, and needed the ability to see when each other's tasks were completed 3. EHRs were not interoperable with other EHR systems or with tablet devices used by practices to administer behavioral health screening surveys **4 EHR workarounds were found** 1. Double documentation and duplicate data entry — Copy and paste used to add the same note to the primary care EHR and the behavioral health EHR — 3 practices used tablet devices to automate screening but the devices did not have the necessary interfaces to upload the data to the EHRs — One practice developed a separate health IT interface to extract specific data fields from 2 EHRs and the tablet screening tool. The summary report for patients and providers to view on a shared screen only had specific information and was not bidirectional 2. Scanning and transporting documents — To overcome 2 different EHRs that were not interoperable, one practice printed daily medication lists from the behavioral health EHR for patients attending the primary visits, requiring additional staff 3. Reliance on patient or clinician recall for inaccessible clinical information — Providers describe this as "flying blind" 4. Use of free-standing tracking systems — Required additional staff time to maintain **Emerging solutions** 1. Customized EHR templates 2. EHR upgrades 3. Unified EHRs

©2021 ECRI. All Rights Reserved.

Study Details	Patients/Study Methods	Intervention/Treatment	Outcomes/Results
Reference: Etter et al. (2018)[2] **Study design:** Prospective cohort study **Purpose:** To assess the feasibility of using an existing computer decision support system (CDSS) to screen adolescent patients for suicidality and provide follow-up guidance to clinicians in a primary care setting	**Health IT:** Screening, documentation **Setting:** 2 primary care, federally qualified health center clinics that utilize the Child Health Improvement through Computer Automation (CHICA) system **Participants:** 2,134 adolescent patients (51% female, 60% black, mean age 14.6 years) **Study period:** September 1, 2014–September 30, 2017 **Inclusion criteria:** Patients ages 12–20 years presenting for an annual (non–sick visit) or sick visit who completed a previsit screener form (PSF) **Exclusion criteria:** NR **Study methods:** Patients presenting to the clinic were selected to participate in the controlled trial. The CHICA system automatically generated a PSF based on patient information found in the electronic medical record (EMR). The PSF was administered on an electronic tablet. A provider worksheet was generated based on PSF responses	**Interventions:** Implementation of CDSS that screened patients for suicidality and provided follow-up recommendations to providers — Patient History Questionnaire (PHQ)-2 and -9 were used to screen for suicidality and depression — American Academy of Pediatrics' Bright Futures guidelines were used to screen for substance use. A positive response would trigger the CRAFFT adolescent substance use screener **Outcomes:** The prevalence of suicidality and the provider follow-up treatments EMR system data — Previsit screening data — Correlative provider response	**Outcomes:** Incorporating adolescent suicide screening and providing follow-up guidance into an existing CDSS in primary care is feasible and utilized by providers — 6% (n = 131) of patents endorsed suicidality ▪ 10% of those patients were determined to be at high risk after provider assessment ▪ Female gender and depressive symptoms were consistently associated with suicidality — 9.3% of girls versus 2.0% of boys endorsed suicidality — 22.4% of those who endorsed suicidality expressed depressive symptoms on the PHQ-2 — 24% of those who endorsed suicidality did not report depressive symptoms Follow-up action to positive screening — Providers documented for 83% of those who endorsed suicidality

©2021 ECRI. All Rights Reserved.

Study Details	Patients/Study Methods	Intervention/Treatment	Outcomes/Results
Reference: Aleem et al. (2015)[3] **Study design:** Process improvement project, before-and-after study **Purpose:** To focus on leveraging the EHR as well as work flow redesign to improve the efficiency and reliability of the process of depression screening	**Health IT:** Screening **Setting:** A vertically integrated healthcare organization with various primary care locations in New Hampshire and Vermont **Participants:** 41,539 patient visits **Study period:** September 2013–April 2014 **Inclusion criteria:** Total visits by patients >18 years during the time frame **Exclusion criteria:** Patients <18 years **Study methods:** Lean Six Sigma methodology for patient visits during the implementation period (September 2013–April 2014) using a standardized depression screening mechanism to reduce duplication and ensure appropriate follow-up	**Interventions:** Change depression screening tool, optimization of data entry in EHR. Follow-up of positive screen, staff training, and EHR redesign **Outcomes:** Single screening tool and simplified data entry, branching out and tracking — Increase screening with PHQ-2 to >50% of visit encounters — Maintain a PHQ-2 duplication rate below 5% — Ensure that >90% of patient encounters have a documented PHQ-9 if the PHQ-2 score was ≥3	**Outcomes:** Encounters with documented PHQ-2/PHQ-9 — Preintervention 17% versus postintervention 75.9% ($P < 0.001$) Unanticipated consequence postintervention after data optimization: 1. Duplicate screening — September–October 2013 ▪ Increase from 6% to 11.7% ($P < 0.001$) — November 2013–April 2014 ▪ Decreased to 4.7%, representing a statistically significant decrease ($P > 0.001$) 2. PHQ-9 completion rate for patient encounters with PHQ-2 ≥3 initially dropped to 88.4% and then rose to 94.7% Note: Impact of clinical intervention could not be evaluated
Reference: Arauz-Boudreau et al. (2020)[7] **Study design:** Retrospective chart review **Purpose:** To explore the impact of using an EMR system to administer, score, and store the Pediatric Symptom Checklist (PSC-17) during annual pediatric well-child visits	**Health IT:** Screening **Setting:** A single urban outpatient pediatric practice **Participants:** 1,773 patients **Study period:** January 1, 2017–June 30, 2018 **Inclusion criteria:** Insured by Medicaid **Exclusion criteria:** Not insured by Medicaid **Study methods:** PSC-17 screening, administrative claims (Current Procedural Terminology [CPT] codes), and chart review data were extracted from the EMR	**Interventions:** A system designed by Partners Healthcare that was based on the MyChart module of Epic, which allows clinicians to schedule, administer, score, and store patient-reported outcomes measures for tracking behavioral health outcomes as required by Early and Periodic Screening, Diagnostic and Treatment; Children's Behavioral Health Initiative; or other programs **Outcomes:** Feasibility of electronic screening using the PSC-17 including: — Validity of CPT coding of screening and risk — Clinical usefulness of electronic screening	**Outcomes:** 95.3% of participants (N = 1,609) were administered a PSC-17 screen — Increase of screening using an electronic method of 95.1% versus previously reported screening rates in the same setting using paper-based method of 83% versus the state-wide screening rate range (61.52%–to 66.73%) — 82.6% (N = 1,464) had evidence of a competed PSC-17 — 90.4% (N = 1,602) had a 966110 billing code for the screen — 77.4% (N = 1,373) had both a 96610 billing code for the screening and had completed a PSC

©2021 ECRI. All Rights Reserved.

Study Details	Patients/Study Methods	Intervention/Treatment	Outcomes/Results
Reference: Gill et al. (2012)[8] **Study design:** Nonrandomized, controlled trial **Purpose:** To examine the impact of introducing an efficient EHR-based screening tool for bipolar disorder (BPD) into primary care practices	**Health IT:** Screening **Setting:** A national practice-based research network of physicians and other clinicians in ambulatory care practices that use the outpatient Centricity EMR (GE Healthcare, Waukesha, WI) **Participants:** 17,134 patients **Study period:** April–October 2009 **Inclusion criteria:** Diagnosis at the start of the study period of unipolar depression but no diagnosis of BPD **Exclusion criteria:** Patient with a prior diagnosis of BPD **Study methods:** The screening instrument automatically displayed during each office visit for patients with a diagnosis of depression. This was a secondary screening targeted at a high-risk group that already carried a potentially inaccurate diagnosis of depression	**Intervention:** Clinical decision support embedded in the EHR. The screening tool was an instrument for BPD contained in the World Health Organization Composite International Diagnostic Interview (CIDI) **Outcomes:** — Percentage of patients for whom the screening tool was used — Rates of new diagnosis of BPD — Rates of new medication prescriptions for BPD	**Outcomes:** — Intervention group: N = 8,355 — 47.5% (3,969) were screened — 2.5% of those screened scored at high or very high risk for BPD Comparison group: N = 8,799 — 93 patients versus 32 were newly diagnosed with BPD (1.11% versus 0.36%; $P < 0.01$) — 146 patients versus 100 had new BPD medications entered in the EHR (1.85% versus 1.19%; $P < 0.01$) — 59.1% versus 43.8% newly diagnosed patients had a new prescription in the intervention versus the comparison group

©2021 ECRI. All Rights Reserved.

Study Details	Patients/Study Methods	Intervention/Treatment	Outcomes/Results
Reference: Staeheli et al. (2017)[1] **Study design:** Quasi-experimental design (no randomization to treatment) **Purpose:** To compare screening results to data derived from chart reviews of patients seen prior to the deployment of the screening interventions to determine the rates of unrecognized and undiagnosed depression, posttraumatic stress disorder (PTSD), and risky drinking and whether increased recognition is associated with treatment and follow-up	**Behavioral health IT:** Screening **Setting:** Urban Connecticut primary care Federally Qualified Health Center (FQHC) **Participants:** 314 patients with medical appointments **Study period:** September–December 2013 **Inclusion criteria:** Patients with appointments seen by the primary care providers on screening days **Exclusion criteria:** Patients seen in the clinic who did not have a medical appointment (e.g., immunization, blood pressure, hemoglobin A1C checks, diabetic foot or retinopathy exams) **Study methods:** Of the 314 patients with appointments between September and December of 2013, 146 were asked by the receptionists to complete the electronic risk screening questionnaire. Results were compared with a control group of 129 patients who were seen in the same clinic in a 2-week period in August 2013 through a systematic review of the medical record	**Intervention:** Screening obtained during target appointment — PHQ-9 for depression — PTSD questions from My Mood Monitor (M-3) — Risky drinking: Alcohol Use Disorders Identification Test–Consumption (AUDIT-C) **Outcomes:** Intervention group primary outcome — Screening results obtained during the target appointment using PHQ-9, M-3, or AUDIT-C Control group — The presence or absence of depression, PTSD, or alcohol problems in the target appointment	**Outcomes:** Patients in the intervention group were 5× more likely to be identified with depression ($P < 0.05$) — Odds ratio (OR) = 5.3 — 95% confidence interval (CI) = 2.5, 11.3 PTSD was virtually unrecognized among control group but was observed in 23% of the intervention group ($P < 0.01$) — Prevalence in the intervention group exceeded 28% — OR = 105.6 — 95% CI = 6.5, >999 Alcohol abuse was 3.5× more likely to be identified among the intervention group but the finding was not statistically significant The vast majority of behavioral health problems identified in the intervention group were new cases: — Alcohol 100% — Depression 78.8% — Problem list 96.9% Rates of documentation in patients' EHRs of those screening positive: — Alcohol ▪ Notes 16.7% ▪ Problem list 0% — Depression ▪ Notes 39.4% ▪ Problem list 9.1% — PTSD ▪ Notes 12.5% ▪ Problem list 6.3% Rates of follow-up care: — Alcohol 0% — Depression 18.2% — PTSD 6.3%

©2021 ECRI. All Rights Reserved.

Study Details	Patients/Study Methods	Intervention/Treatment	Outcomes/Results
Reference: Kobus et al. (2013)[9] **Study design:** Retrospective chart review **Purpose:** To describe how an academic family medicine department is currently using the EHR to document the diagnosis and treatment of patients with depression and to evaluate baseline data that will be used to identify potential future changes to the EHR to enhance its functionality with the goal of improving the quality of depression care	**Health IT:** Documentation **Setting:** 4 outpatient clinics of the Department of Family Medicine at Oregon Health and Science University **Participants:** 200 patients **Study period:** January 1–June 30, 2009 **Inclusion criteria:** Adult patients >18 years with any coded diagnoses for new depression **Exclusion criteria:** Patient who had a previous depression code in their problem list, had an encounter for depression during the previous 6 months, or who had a non-family-medicine provider **Study methods:** Electronic data abstraction, and manual chart were review for patient demographics and to assess the clinical documentation of depression screening, diagnosis, and treatment practices	**Intervention**: Chart review to identify new depression diagnosis **Outcomes:** 1. What data were documented regarding the diagnosis of depression? 2. What treatment options were discussed with the patient? 3. Was there documentation of initial medication treatment, including screening for a history of mania?	**Outcomes:** 72% of new depression diagnoses were documented using the PHQ-9 or the SIG-E-CAPS questions (sleep, interest, guilt, energy, concentration, appetite, psychomotor, and suicidal ideation) — 71% were started on medication — <4% had a screening for mania Documentations of treatment options: — 51% medication — 32% a combination of medications and psychotherapy

©2021 ECRI. All Rights Reserved.

Study Details	Patients/Study Methods	Intervention/Treatment	Outcomes/Results
Reference: Woodson et al. (2018)[10] **Study design:** Mixed-methods, comparative case study **Purpose:** Describe the workflows and tasks of integrated behavioral healthcare providers working with adult patients to identify their health IT needs and develop EHR tools to address them	**Health IT:** Sharing/documentation **Setting:** FQHCs in Oregon, with varied approaches to integrating behavioral health providers into their primary care team **Participants:** 6 FQHCs **Study period:** November 2013–May 2014 **Inclusion criteria:** 2 to 4 practice members at each site **Exclusion criteria:** N/A **Study methods:** Observed clinical work and conducted interviews to understand workflows and clinical tasks, to identify how effectively current EHRs supported integrated care delivery	**Interventions:** Observed clinical work and conducted interviews to understand specific needs and workflows of the integrated care teams **Outcomes:** — Identified behavioral health IT challenges/needs — Developed new feature and functionality to meet identified needs	**Outcomes:** Assessment and documentation needs identified: — Reduce use of paper screening tools — Eliminate manual entry and tabulation of scores — Track scores over time — Quickly select diagnosis codes and indicate the severity — Quickly document patient progress during appointments — Populate eligible behavioral health billing codes for successful reimbursement Information retrieval needs identified: — Quickly identify personal and family history related to behavioral health — Quickly review behavioral health history during a visit Monitoring and tracking needs identified: — Mechanism to easily document goals — Document/review patients' challenges and opportunities to change/achieve goals — Track patient goals over time — Track patient panel for follow-up and outreach Features and functionality provided: — Behavioral health assessment tab — Visit diagnosis — Progress note — Level of service — Personal history and family behavioral health history — Snapshot — Goals/challenges/opportunities and follow-up — Repurposed existing space and tools

©2021 ECRI. All Rights Reserved.

Study Details	Patients/Study Methods	Intervention/Treatment	Outcomes/Results
Reference: Burdick and Kessler (2017)[11] **Study design:** Observational design extract of a convenience sample of 866 encounters in which staff administered the 4-question behavioral health screening CDS tool (intervention group) **Purpose:** To design and implement Screening, Brief Intervention, and Referral to Treatment (SBIRT) using CDS tools in a commercial EHR and to conduct a pragmatic evaluation of the impact of the tools on clinical outcomes	**Health IT:** Screening **Setting:** 5 ambulatory primary care clinics affiliated with the University of Vermont Medical Center, an academic, tertiary care integrated delivery network **Participants:** 866 patient encounters **Study period:** 2011 and 2012 **Inclusion criteria:** All patients during the study period **Exclusion criteria:** No exclusions **Study methods:** Gathered stakeholder consensus on clinical goals to address current gaps. Designed a future-state workflow and EHR tool for performing SBIRT processes. Implemented the workflow and tools into primary care clinical practice. Extracted and analyzed the use of these tools. There was no attempt to enforce the use of the tools or to randomize the implementation	**Intervention:** Development of EHR tools — Worksheet for documenting screens for 3 domains: depression (PHQ) generalized anxiety disorder (GAD); Alcohol Use Disorders Identification Test (AUDIT); and prescription drug misuse — 5 alerts with clinical recommendations based on screenings — Reminders for annual screenings Implemented the new tools in 5 ambulatory care clinics **Outcomes:** 1. To assess the feasibility of development and implementation of the behavioral health screening workflows and associated CDS tools 2. To conduct a preliminary evaluation of the CDS tools, including their use in the clinic and the outcomes of encounters when the tools were used	**Outcomes:** — 1 domain—positive screening rate 21%, and among these: ▪ 60% screened positive for depression ▪ 25% screened positive for alcohol use ▪ 7% screened positive for prescription misuse — 2 domains—Positive screening rate 11% — 3 domains—Positive screening rate 0 In all cases, screening increased brief intervention and referral for treatment rates, regardless of the outcome of the screening (positive or negative)

©2021 ECRI. All Rights Reserved.

Study Details	Patients/Study Methods	Intervention/Treatment	Outcomes/Results
Reference: Sudhanthar et al. (2015)[12] **Study design:** Plan-Do-Study-Act (PDSA) model **Purpose:** Increase the rate of depression screening based on a PDSA cycle	**Health IT:** Screening **Setting:** Michigan State University College of Human Medicine **Participants:** 100 **Study period:** 2012–2014 **Inclusion criteria:** Adolescents ages 11–21 years who presented for a yearly physical or sports physical **Exclusion criteria:** Patients who had an existing diagnosis of depression **Study methods:** A retrospective review of 100 health records from 2012–2013 compared after implementation of the new process at 6 and 12 months	**Intervention:** The PHQ-2 tool was embedded in all charts — A clinical protocol was developed for the PHQ-2 with a score of ≥3 requiring administration of the PHQ-9 — Explanation of categories of depression was incorporated into the tool **Outcome:** — Increased depression screening — Improved referral rate	**Outcomes:** Screening rate improved from 10%–15% from the previous 2 years to: — 65% at the end of 6 months — 82% at the end of 12 months Referral to mental health services increased by 38% compared with the previous years
Reference: Tai et al. (2012)[13] **Study design:** Consensus meeting **Purpose:** The National Institutes of Health and the Society for Behavioral Medicine held a meeting to develop consensus on common data elements (CDEs) for patient-reported factors in behavioral, psychosocial, and patient-characteristic domains	**Health IT:** Sharing **Setting:** Conference: "Using IT to Improve Community Health: How Health Care Reform Supports Innovation" **Participants:** Healthcare service providers, biomedical researchers, policymakers, and patient advocates **Study period:** May–August 2011 **Study methods:** A three-phase process was devised	**Intervention:** Phase 1—Expert panel reviewed existing measures and developed initial recommendations for 2 to 4 measures for use in primary care Phase 2—The Grid-Enabled Measures (GEM) was used to present the recommendations from the expert panel and to collect feedback from a wide range of stakeholders Phase 3—A town hall meeting was held to enable broad discussion among various interested parties **Outcome:** Stakeholders who worked together to generate consensus on final recommendations	**Outcomes:** Consensus was reached on behavioral and psychosocial CDEs for 9 of 13 domains. CDEs were identified from well-validated survey instruments. — Diverse stakeholders came to consensus on CDEs that are: ▪ Brief ▪ Valid ▪ Feasible ▪ Actionable — Recommendations were made for the optimal frequency of use for risk assessment

©2021 ECRI. All Rights Reserved.

Study Details	Patients/Study Methods	Intervention/Treatment	Outcomes/Results
Reference: Anderson et al. (2015)[14] **Study design:** Retrospective cohort study **Purpose:** To estimate the use of diagnostic codes in EHRs to document suicidal ideation and attempts among patients seen in primary care	**Health IT:** Documentation **Setting:** 8 primary care eNQUIRENet (a distributed health data network formerly known as DARTNet) practices **Participants:** 32,385 patients **Study period:** Prior study data used, 2004–2010[15] **Inclusion criteria:** New episode of depression **Exclusion criteria:** Previous episode of depression **Study methods:** A retrospective analysis was performed from 3 data sources; clinician notes filed using natural language processing (NLP), suicidal ideation item on PHQ-9, and diagnostic codes from the EHR	**Intervention:** — Identification of patients who indicated thoughts of death or hurting themselves on the PHQ-9, as well as patients whose clinician indicated suicidal ideation or suicide attempt in the notes field of their EHR — Calculation of the percentage of patients with a corresponding diagnostic code for suicidal ideation or attempt recorded in the EHR **Outcome:** Analysis of 4 subsets of patients 1. Patients with text data from history of present illness (HPI) note fields 2. Patients with a recorded response for the 9th item of the PHQ-9 3. Patients with HPI data or PHQ-9 item 4. Patients with both HPI data and PHQ-9 item	**Outcomes:** Patients with NLP-processed HPI data (N = 15,761) — 1,025 had an indication of suicidal ideation recorded in their HPI notes ▪ 3% (N = 30) had a corresponding ICD-9 code indicating suicidal ideation recorded in their EHR (κ = 0.036) — Agreement between suicidal ideation from item 9 of the PHQ-9 and an *International Classification of Diseases* (ICD-9) code was slightly higher (κ = 0.068) — An indication of suicidal ideation from the HPI notes or PHQ-9 item 9 did not increase agreement with an ICD-9 code for suicidal ideation (κ = 0.04) — No patients had an indication of suicidal ideation from both the HPI note field and item 9 of the PHQ-9 — Suicide attempt was more likely than suicidal ideation to be recorded using an ICD-9 code ▪ 86 patients had an indication of attempt documented ▪ 19% (N = 16) had a corresponding diagnostic code for suicide attempt recorded (κ = 0.18) Note: 50% of the HPI data records could not be processed through the NLP algorithm, even after a fair amount of data cleaning and algorithm development

©2021 ECRI. All Rights Reserved.

Study Details	Patients/Study Methods	Intervention/Treatment	Outcomes/Results
Reference: Ghitza et al. (2013)[4] **Study design:** Consensus meeting **Purpose:** To provide a resource to vendors on expert-defined and vetted core data elements for SUD that will be incorporated into EHR products in the United States and that support healthcare information exchange (HIE) on a nation-wide basis for improved clinical care and safety	**Health IT:** Screening/documentation **Setting:** Clinical Trials Network EHR workshop **Participants:** 85 SUD treatment, EHR development and standardized medical vocabulary experts **Study period:** September 2010 **Exclusion criteria:** N/A **Study methods:** Stakeholders were identified and queried for input and consensus on validated screening and assessment for SUD in general medical settings to develop CDEs to serve as shared resources for EHRs on SBIRT, with the intent of supporting interoperability and data exchange in a developing nationwide health information network	**Intervention:** — An EHR workshop of invited experts was convened — Participation in several subject-matter-specific workshops/symposia to present progress and feedback — Senior staff were consulted from the U.S. Department of Health and Human Services, the Office of the National Coordinator for Health Information Technology (ONC), the Office of National Drug Control Policy (ONDCP), the Health Resources and Services Administration (HRSA), the Substance Abuse and Mental Health Services Administration (SAMSHA), and the Centers for Medicare and Medicaid Services (CMS) **Outcomes:** Development of a consensus-based, validated and standardized core set of questions for SBIRT for SUD	**Outcomes:** A core set of validated CDEs was identified for adoption and inclusion. The CDEs for general medical settings will enable the integration of SUD treatment within mainstream healthcare, and support the adoption of ONC-certified EHRs, as well as CMS reimbursement
Reference: Bajracharya et al. (2016)[6] **Study design:** A prospective, postintervention, quasi-experimental design **Purpose:** To evaluate outcomes of the implementation of questionnaires and screening tools and screening protocols in a primary care setting	**Health IT:** Screening **Setting:** Primary care **Participants:** 378 patients **Study period:** 30 days **Inclusion criteria:** Adult patients **Study methods:** A theoretical framework (Roger's "diffusion of innovations") was used to guide change process, implementation, and evaluation of the project	**Intervention:** The PHQ-2 and PHQ-9 were integrated in the EHR **Outcomes:** Primary outcome was the total number of patients with diabetes	**Outcomes:** 378 patient visits — 82% (N = 312) were screened for depression 71 patients had a diagnosis of type 2 diabetes mellitus — 85% (N = 61) were screened for depression The screening rate was significantly higher than the 25% target rate for the study ($P < 0.001$)

©2021 ECRI. All Rights Reserved.

Study Details	Patients/Study Methods	Intervention/Treatment	Outcomes/Results
Reference: Frick et al. (2019)[16] **Study design:** Quality improvement project **Purpose:** To implement a universal suicide screening program in a primary care center	**Health IT:** Screening/documentation **Setting:** Primary care center at Loyola University Chicago **Participants:** 2 medical doctors, 5 advanced-practice nurses/nurse practitioners, 6 registered nurses, and 1 dietitian **Study period:** Fall 2017–spring 2018 **Inclusion criteria:** Students scheduled for a primary care appointment in spring 2018 **Study methods:** Retrospective data comparison to assess suicide screening, chart audits, and mental health referrals. SBQ-9 was distributed to all patients upon check-in for medical appointments and set to be reissued every 365 days	**Intervention:** 1. To implement structured suicide screening using the SBQ-R 2. To develop an EMR template for primary care clinicians to record suicide assessment indicators and track mental health referrals **Outcomes:** A suicide screening program to include: — Comprehensive data collection — Improved staff education — Enhanced chart documentation — Creation of additional mental health referrals	**Outcomes:** Suicide screening using SBQ-R (N = 1,607) — 12.8% (N = 206) screened positive — 4 students declined to participate Documentation — 11 notations regarding suicide in the EMR prior to implementation versus 93 notations after implementation — Statistically significant increase in documentation for: ▪ Advanced-practice nurses ▪ 0.76% (N = 9) before implementation versus 3.42% (N = 56) after implementation ($P < 0.001$) ▪ Registered nurses ▪ 0.11% (N = 2) before implementation versus 1.59% (N = 37) after implementation ($P < 0.001$) Mental health referral tracking — 2.11% (N = 66) referrals before implementation versus 7.33% (N = 237) after implementation ($P < 0.001$) — 0.96% (N = 30) appointments made before implementation versus 2.04% (N = 66) after implementation ($P < 0.001$) Safety alert — 7.58% increase in utilization of the safety flag alert was statistically significant ▪ 0.29% (N = 2) before implementation versus 7.87% (N = 58) after implementation Simulated training — Staff preparedness to screen for mental health concerns: mean "pre" versus "post" 3.83 versus 4.50 ($P = 0.005$) — Staff preparedness to provide information on mental health: mean "pre" versus "post" 3.75 versus 4.58 ($P = 0.005$) — Staff preparedness to use motivational interviewing techniques: mean "pre" versus "post" 3.33 versus 4.33 ($P = 0.001$) — Overall confidence in the ability to provide brief motivational counseling: mean "pre" versus "post" 2.75 versus 3.16 ($P = 0.005$)

©2021 ECRI. All Rights Reserved.

References

1. Staeheli M, Aseltine RH, Schilling E, et al. Using mHealth technologies to improve the identification of behavioral health problems in urban primary care settings. SAGE Open Med. 2017 Jun;5:1-8. Also available: http://dx.doi.org/10.1177/2050312117712656. PMID: 28634539.
2. Etter DJ, McCord A, Ouyang F, et al. Suicide screening in primary care: use of an electronic screener to assess suicidality and improve provider follow-up for adolescents. J Adolesc Health. 2018 Feb;62(2):191-7. Also available: http://dx.doi.org/10.1016/j.jadohealth.2017.08.026. PMID: 29195764.
3. Aleem S, Torrey WC, Duncan MS, et al. Depression screening optimization in an academic rural setting. Int J Health Care Qual Assur. 2015;28(7):709-25. Also available: http://dx.doi.org/10.1108/IJHCQA-01-2015-0012. PMID: 26241092.
4. Ghitza UE, Gore-Langton RE, Lindblad R, Shide D, Subramaniam G, Tai B. Common data elements for substance use disorders in electronic health records: the NIDA Clinical Trials Network experience. Addiction. 2013 Jan;108(1):3-9. Epub 2012 May 8. Also available: http://dx.doi.org/10.1111/j.1360-0443.2012.03876.x. PMID: 22563741.
5. Cifuentes M, Davis M, Fernald D, Gunn R, Dickinson P, Cohen DJ. Electronic health record challenges, workarounds, and solutions observed in practices integrating behavioral health and primary care. J Am Board Fam Med. 2015 Sep-Oct;28 Suppl 1:S63-72. Also available: http://dx.doi.org/10.3122/jabfm.2015.S1.150133. PMID: 26359473.
6. Bajracharya P, Summers L, Amatya AK, et al. Implementation of a depression screening protocol and tools to improve screening for depression in patients with diabetes in the primary care setting. J Nurse Pract. 2016 Nov-Dec;12(10):690-7. Also available: http://dx.doi.org/10.1016/j.nurpra.2016.08.009.
7. Arauz-Boudreau A, Riobueno-Naylor A, Haile H, Holcomb JM, Lucke CM, Joseph B, Jellinek MS, Murphy JM. How an electronic medical record system facilitates and demonstrates effective psychosocial screening in pediatric primary care. Clin Pediatr (Phila). 2020 Feb;59(2):154-62. Also available: http://dx.doi.org/10.1177/0009922819892038. PMID: 31808350.
8. Gill JM, Chen YX, Grimes A, Klinkman MS. Using electronic health record-based tools to screen for bipolar disorder in primary care patients with depression. J Am Board Fam Med. 2012 May-Jun;25(3):283-90. Also available: http://dx.doi.org/10.3122/jabfm.2012.03.110217. PMID: 22570391.
9. Kobus AM, Harman JS, Do HD, et al. Challenges to depression care documentation in an EHR. Fam Med. 2013 Apr;45(4):268-71. https://www.stfm.org/familymedicine/vol45issue4/Kobus268. PMID: 23553091.
10. Woodson TT, Gunn R, Clark KD, et al. Designing health information technology tools for behavioral health clinicians integrated within a primary care team. J Innov Health Inform. 2018 Oct 31;25(3):158-68. Also available: https://dx.doi.org/10.14236/jhi.v25i3.998. PMID: 30398459.
11. Burdick TE, Kessler RS. Development and use of a clinical decision support tool for behavioral health screening in primary care clinics. Appl Clin Inform. 2017 Apr 26;8(2):412-29. Also available: https://dx.doi.org/10.4338/ACI-2016-04-RA-0068. PMID: 28447101.
12. Sudhanthar S, Thakur K, Sigal Y, et al. Improving validated depression screen among adolescent population in primary care practice using electronic health records (EHR). BMJ Open Quality. 2015;4:u209517.w3913. doi: 10.1136/bmjquality.u209517.w3913
13. Tai B, Boyle M, Ghitza U, Kaplan RM, Clark HW, Gersing K. Meaningful use of electronic behavioral health data in primary health care. Sci Transl Med. 2012 Feb 1;4(119):119mr3. Also available: https://dx.doi.org/10.1126/scitranslmed.3003324. PMID: 22301552.
14. Anderson HD, Pace WD, Brandt E, Nielsen RD, Allen RR, Libby AM, West DR, Valuck RJ. Monitoring suicidal patients in primary care using electronic health records. J Am Board Fam Med. 2015 Jan-Feb;28(1):65-71. Also available: https://dx.doi.org/10.3122/jabfm.2015.01.140181. PMID: 25567824.
15. Valuck RJ, Anderson HO, Libby AM, Brandt E, Bryan C, Allen RR, Staton EW, West DR, Pace WD. Enhancing electronic health record measurement of depression severity and suicide ideation: a Distributed Ambulatory Research in Therapeutics Network (DARTNet) study. J Am Board Fam Med. 2012 Sep-Oct;25(5):582-93. Also available: http://dx.doi.org/10.3122/jabfm.2012.05.110053. PMID: 22956694.
16. Frick MG, Butler SA, deBoer DS. Universal suicide screening in college primary care. J Am Coll Health. 2019 Aug 5;1:1-6. Also available: https://dx.doi.org/10.1080/07448481.2019.1645677. PMID: 31381487.

©2021 ECRI. All Rights Reserved.

Appendix B. Recommendation Tables

Screening Recommendation 1: Ensure that validated, clinically accepted screening tools are integrated, easily accessible, and readily available in the EHR.

Rationale: Standardized screening tools may serve as a useful preliminary evaluation in the primary care setting.[1] The automated streamlined process of screening can increase identification and recognition of patients requiring treatment and those who would benefit from behavioral health referrals.[2] Electronic barriers to depression screening can be eased by incorporating validated screening tools in patients' records, making the process easier and more efficient in the primary care setting.[3]

Screening Strategies	Developers' Actions	Other Actions	Action for Measurement
Identify validated screening tools applicable to: — Priority behavioral health conditions and diagnoses — Differing levels of integration models — Various settings (e.g., inpatient, ambulatory care, emergency department, telemedicine) — Diverse populations — Reducing cost/benefit inhibitors that limit more widespread inclusion of electronic screening tools	— Use CDS to create reminders to clinicians to perform/assess the screenings for the appropriate patients — Enable the EHR or other health IT to trigger the screening tools based on the organization's desired workflows and clinical guidelines — Integrate screening tools within the EHR, make interoperable with the EHR via associated patient portal, etc., and/or externally integrate via APIs and apps ▪ Encourage end users to use tools enabled by EHR implementations, noting that it is optimal for the tool to be either directly embedded in the EHR or available via an API — Incorporate documentation of the screening results including an option for manual entry of screening results	**Healthcare organizations and clinicians** Developers, clinicians, and healthcare organizations should collaborate to: — Encourage developers to use tools directly embedded or available via an API — Design smooth workflows that align with the electronic workflow to simplify screening processes — Provide clinician education ▪ Accessing tools ▪ Choice of tools ▪ Workflow process — Provide tools for patient education regarding access to screening assessments — Provide education to end users on recognition of patients requiring intervention and the appropriate action to be taken based on the screening-result CDS guidance — Leverage APIs to record and communicate the results of the embedded screening tools ▪ Enable the connection and exchange of standard formatted information with HIEs ▪ Facilitate coordinated patient care ▪ Reduce duplicate treatments and avoid costly mistakes[4] **Regulators** Developers should encourage: — ONC, CMS, and SAMSHA to provide a list of validated screening tools to be used for different priorities and diagnoses, in various settings, for various conditions and comorbidities and based on population health issues and recognized SDoH — Identification of priority screening tools (e.g., for opioid use) for potential governmental support/incentives to help defray the screening-tool economic issues identified — ONC to continue to drive adoption and implementation guidance for APIs suitable to advance integration of behavioral health for screening tools — The federal government to support behavioral health and primary care clinical organizations that drive the screening tools with incentives to implement their tools on apps that can be accessed via APIs by EHRs (and potentially directly accessible to patients)	Ensure that computable data elements available for screening align with the external and internal requirements of the healthcare organization — Compliance for screening tools — Appropriateness of CDS alerts
Incorporate screening tools into EHRs with the functionality to: — Display usable results for clinician and healthcare organization to create awareness, acknowledgment, and action[5] — Facilitate collaboration and communication of the screening results between clinicians within and across health systems — Allow internal and external reporting, including for clinical quality measures used by payers and healthcare organizations	— Apply user design[5] concepts to display the screening tool, scores, and recommendation in a clear, easily visualized format ▪ Automate tabulation of individual screening scores ▪ Apply step logic to indicate additional needed assessment and/or follow-up ▪ Aggregate tracking and trend analysis of both individual patient data and general population data ▪ Enable the transfer of summary/score from screenings Enable bidirectional communication to HIEs for behavioral health information and to incorporate screening results — Enable sharing with HIEs ▪ Identified screening information ▪ Patient-facing reports — Use APIs to connect to screening tools (e.g., via SMART on FHIR®) — Enable report creation for internal and external reporting		

©2021 ECRI. All Rights Reserved.

Screening Recommendation 2: Enable triggers for CDS associated with screening tools to integrate behavioral health and primary care.

Rationale: The implementation of CDS promises to enhance evidence-based practice.[6] CDS systems can be used effectively in primary care to ensure screening for behavioral health issues, including suicidal ideation, and provide follow-up recommendations for clinicians based on screening results.[7]

Screening Strategies	Developers' Actions	Other Actions	Action for Measurement
Identify the data elements needed to trigger application of screening and follow-up based on guidelines, clinical preferences, external reporting requirements, regulations, and organizational policies using: — Relevant CDS for the appropriate patients — Minimum set of behavioral data elements ▪ Clinical ▪ Demographic (e.g., SDoH) ▪ Administrative	— Incorporate the functionality needed to trigger CDS based on clinical knowledge and specific data elements (e.g., clinical knowledge base, clinical guidelines, and quality measures) — Apply clinical rules that are provided by appropriate professional organizations and supported (e.g., updated when appropriate) by the same professional organizations — Enable a process to add and prioritize data elements	**Healthcare organizations and clinicians** Developer, clinicians, and healthcare should collaborate to: — Identify gaps in behavioral health data elements for the USCDI ▪ Submit additional data element specific to behavioral health for inclusion in the USCDI ▪ Review and identify use cases and determine elements that should be exchanged to facilitate care — Implement organizational policies for screening ▪ Frequency ▪ Need for follow-up — Apply risk stratification to inform workflow: ▪ Frequency of follow-up ▪ Referral to behavioral health clinician ▪ Need for outreach following **Regulators** Developers should encourage: — ONC to use its certification and USCDI update processes for adding or deleting data elements in the USCDI — ONC to consider and include foundational behavioral health data elements to the USCDI and certification required for effective integration of behavioral health and primary care — ONC and CMS to streamline reporting by reducing redundancy	Ensure that the computable data elements available for screening align with the external and internal requirements of the healthcare organization — Compliance for screening tools — Appropriateness of CDS alerts
Use data extracted from the EHR to trigger CDS and prompt clinical consideration:[8] — For recognition and identification of behavioral health needs — To enable predictive models to determine patterns and to predict potential future outcomes and trends — For accurate risk stratification of the severity of the illness to inform clinical decisions[9]	— Incorporate predictive models/algorithms based on ▪ Risk factors ▪ Patient behavioral health ▪ History ▪ Family history of behavioral health problems (e.g., schizophrenia, suicide, depression) ▪ Screening scores and trends — Enable the ability to stratify illness severity for ▪ Identification ▪ Follow-up ▪ Tracking ▪ Monitoring		

©2021 ECRI. All Rights Reserved.

Documentation Recommendation: Optimize documentation to support integration of behavioral health and primary care.

Rationale: Clinical documentation in the EHR needs to be simplified and standardized if the data extraction and exporting processes of clinical performance data are to become efficient and routine practices.[10] Documentation should support clinical care and sharing of data among behavioral health and primary care clinicians.

Documentation Strategies	Developers' Actions	Other Actions	Action for Measurement
Streamline behavioral health data entry For information sharing: — Facilitate interoperability — Allow for secure messaging among clinicians — To simplify external and internal reporting needs To reduce variation in documentation, through uniform: — Visualization of screening data — Screening workflows (e.g., for depression) — Flow-sheet in EHR regardless of data source (i.e., patient-entered or clinical-staff-entered data)[11] Standardize data elements needed for behavioral health including: — Data elements for the SDoH — Behavioral health diagnosis with the ability to document discrete applicable information, including: ▪ Mild, moderate, or severe as applicable — Family behavioral health history — Ability to incorporate free-text notes	— Incorporate data entry tools that are designed to be efficient and user-friendly — Ensure the EHR has the ability to apply security and consent tags, that are both automated by the system and configurable by the end user, to documented information to facilitate secure sharing within and across healthcare organizations consistent with state and federal law, organizational policies, and patient preferences — Support (directly or through mapping) standard vocabularies and code sets (e.g., LOINC®, SNOMED-CT®, ICD-10, DSM-5, and CPT) to enable ▪ Clinical data documentation and interoperable data sharing ▪ Billing ▪ Reporting — Facilitate incorporation of shareable documentation templates and flowcharts — Provide the functionality to make behavioral health documentation searchable within the EHR — Develop and deploy natural language processing tools to apply structure (e.g., coding) to free-text data	**Healthcare organizations and clinicians** Developer, clinicians, and healthcare should collaborate to: — Simplify documentation by creating clinical workflows to align with behavioral health data entry — Use standard vocabulary formats of LOINC®, SNOMED-CT®, ICD-10, DSM-5, and CPT to enable ▪ Clinical data documentation ▪ Billing ▪ Reporting — Provide education to clinicians on the use of the functionality available in the EHR to segment patient information as required by HIPAA, 42 CFR Part 2, organizational policies, and/or patient preference **Regulators** Developers, government, clinicians, and healthcare organizations should participate and support efforts to: — Minimize regulatory documentation requirements — Ensure that the necessary components needed for payment programs are clear, specific, and measurable	Provide functionality to use computable data to complete measures/ measurement — Available documentation elements ▪ Screening ▪ Follow-up plan or referral — Elements needed for reporting: ▪ CQM ▪ NQF
Represent data directly or via mapping for: Clinical documentation: — SNOMED-CT®, LOINC® — ICD-10, SNOMED-CT®, DSM-5 — HL7® FHIR® resources and other HL7® data standards (e.g., C-CDA®, CDA) — Emerging SDoH code sets (e.g., Gravity Project) Billing documentation — ICD-10, DSM-5, and CPT Reporting documentation (e.g., internal and external quality reporting, registry reporting) — SNOMED-CT®, LOINC® — ICD10, DSM-5, and CPT — HL7® FHIR® resources and other HL7® data standards (e.g., C-CDA®, CDA)	— Create a feedback loop to prompt the provider if there are sensitive data that should be flagged for limited or no sharing as required by HIPAA, 42 CFR Part 2, and patient consent — Incorporate use of SNOMED-CT®, LOINC®, ICD-10, DSM-5, CPT, FHIR®, and other HL7® standards to facilitate information for priority use cases (see **Appendix E**)		

©2021 ECRI. All Rights Reserved.

Sharing Recommendation 1: Enable information sharing across care environments (within organizations, among clinicians in the same system, or across organizations and systems) and with portals, secure messaging, and HIEs.

Rationale: The bidirectional sharing of patient behavioral health information is an iterative process essential to support the integration of behavioral health and primary care.

Sharing Strategies	Developers' Actions	Other Actions	Action for Measurement
Data sharing capabilities should include clinical information at the granular level (refer to use cases in **Appendix E**) — Identify sharing mechanisms within and across systems to facilitate the desired sharing between healthcare organization/clinician to healthcare organization/clinician to clinician — Include the ability to segregate information as applicable to selected clinicians and other authorized parties in compliance with 42 CFR Part 2, using structured and encoded data — Enhance health information infrastructure to support interoperability, usability, information exchange[12] — Enable information technologies supporting the sharing of clinical health information across systems: ▪ Consolidated-Clinical Document Architecture (e.g., C-CDA®,) ▪ HL7® FHIR®[13] — Ensure clinically related data at the granular level to support: ▪ Billing (e.g., insurance, workers' compensation) ▪ Preauthorizations (e.g., medications, testing, and treatment therapies — Ensure data sharing capabilities to support quality measurement and other reporting (e.g., public health reporting) — Ensure data capabilities for coordinating sharing of behavioral health and primary care data directly with patients and caregivers	— Enable technology tools for sharing through: ▪ Secure messaging between providers ▪ Transfer of information within systems and across sites — Provide transport mechanism to distinguish sensitive data elements (e.g., clinical notes and care plans) from nonsensitive data elements (e.g., clinical notes and care plans) for exchange: ▪ Direct messaging and secure email ▪ C-CDA® and other FHIR® resources — Enable the ability to configure clinical information to be restricted from being shared, using standard terminologies and codes (e.g., access restrictions, diagnoses, problems, procedures, medications, and lab results) — Enable the ability to customize systems to accommodate state regulations affecting information sharing — Allow for ability to tag information to enable data segmentation and consent management ▪ Entire exchange message is segmented (access limited/restricted) ("all or nothing") ▪ More selective where some aspects of what is being shared need to be segmented (access limited/restricted) (tagging needs to be descriptive) — Allow for the ability to segregate/segment information as applicable to selected providers/clinicians (42 CFR Part 2) — Identify the measures relevant to customers and support data elements to enable these measures	**Healthcare organizations and clinicians** Developers, clinicians, and healthcare organizations: — Make sure that the needed data elements are present in the EHR and that the clinicians populate these data fields — Use secure messaging options for clinician-to-clinician communication — Identify policies/procedures applicable to regulations that are needed to support sharing — Configure clinical information to be restricted from being shared using standard terminologies and codes (e.g., access restrictions, diagnoses, problems, procedures, medication, and lab results) — Recognize the level of integration of systems that are available for sharing information in, across, and outside the organization[14] — Identify current infrastructure to deploy APIs to enable the sharing of granular data **Regulators** Developers, government, clinicians, and healthcare organizations should request that: — ONC continue to drive efforts to enhance health information infrastructure to support interoperability, usability, and information exchange[12] — Congress and HHS address regulatory changes to address sharing by clarifying the language of 42 CFR Part 2 to encourage the sharing of behavioral health data to integrate behavioral health and primary care for the: ▪ Sender ▪ Receiver — Congress and HHS establish a legal and regulatory framework to enable the safe sharing of Part 2 data ▪ Align legal and clinical standards ▪ Clarify Part 2 and non-part 2 requirements	Do you have the correct data elements available to support interoperability? Do you have the correct data elements available to measure the adequacy of the C-CDA®?

©2021 ECRI. All Rights Reserved.

Sharing Recommendation 2: Enable EHRs to use information in the record to segment patient information for exchange consistent with organizational policies, patient requests, and state and federal laws and regulations.

Rationale: Sharing behavioral health information allows for care coordination and improves quality, safety, and cost. The sharing of behavioral health patient information must consider regulations such as HIPAA and 42 CFR Part 2 to prevent all patient information from becoming Part 2 data.

Sharing Strategies	Developers' Actions	Other Actions	Action for Measurement
EHRs should include data segmentation capabilities needed to support HIPAA, 42 CFR Part 2, and patient consent EHRs should support separating behavioral health information in the medical record from HIPAA-defined psychotherapy notes Support healthcare organization implementation of special protections for information on SUD treatment (42 CFR Part 2) — Enable a non-part 2 entity to segregate any specific SUD records received (either directly, or through another lawful holder) from a Part 2 program that is part of or external to the healthcare organization Enable a healthcare organization to identify units or individuals within the organization as Part 2 "programs" whose information requires segregation and other special protections	— Enable tagging to facilitate segregation — Use standard codes (LOINC®, ICD, CPT, DSM-5) and terminologies (SNOMED-CT®) to select: ▪ Clinical information for sharing ▪ Clinical information to be restricted from sharing — Enable the ability for EHR users to configure access restriction to psychotherapy notes consistent with: ▪ Clinician preferences ▪ Organization policies ▪ State and federal laws and guidelines — Incorporate templates for HIPAA-defined psychotherapy notes from the medical record to ensure that they are segregated to meet HIPAA criteria and are not shared — The implementation of information segmentation capability should be done at the data element level (CFR 170.315(b)(7) (https://www.healthit.gov/test-method/security-tags-summary-care-send-0) ▪ To honor patient consent ▪ To support regulatory requirements — Use configurable security and consent tags for clinical documentation to facilitate secure sharing within and across healthcare organizations consistent with state and federal law and patient preferences	**Healthcare organizations and clinicians** Developers, clinicians, and healthcare organizations should: Create workflows to accommodate regulatory restrictions — Use structured fields to document information that will facilitate using standards to enable segregation: ▪ ICD ▪ CPT ▪ LOINC® **Regulators** — Clarify and provide guidance on the impact of data segmentation abilities for use and storage (What if I can't store it? What if I can't use it? Can I receive it?) — Clarify accountability for conditions where a sending system can properly segment data but the recipient cannot (e.g., do segmentation capabilities need to be negotiated prior to exchange?)	Do you have the correct data elements available to support interoperability? Do you have the correct data elements available to measure the adequacy of the C-CDA®?

API, application programming interface; C-CDA®, Consolidated-Clinical Document Architecture; CDS, clinical decision support; CMS, Centers for Medicare and Medicaid Services; CPT, Current Procedural Terminology; DSM-5, Diagnostic and Statistical Manual of Mental Disorders, 5th ed.; CQM, clinical quality measures; EHR, electronic health record; FHIR®, Fast Healthcare Interoperability Resources; HHS, Department of Health and Human Services; HIE, health information exchange; HIPAA, Health Insurance Portability and Accountability Act; ICD-10, International Classification of Diseases, 10th ed.; IT, information technology; LOINC®, Logical Observation Identifiers Names and Codes; NQF, National Quality Forum; ONC, Office of the National Coordinator for Health Information Technology; SAMHSA, Substance Abuse and Mental Health Services Administration; SDoH, social determinants of health; SMART, Substitutable Medical Applications and Reusable Technologies; SNOMED-CT®, Systematized Nomenclature of Medicine, Clinical Terms; USCDI, United States Core Data for Interoperability

©2021 ECRI. All Rights Reserved.

References

1. Frick MG, Butler SA, deBoer DS. Universal suicide screening in college primary care. J Am Coll Health. 2019 Aug 5;1:1-6. Also available: https://dx.doi.org/10.1080/07448481.2019.1645677. PMID: 31381487.
2. Sudhanthar S, Thakur K, Sigal Y, et al. Improving validated depression screen among adolescent population in primary care practice using electronic health records (EHR). BMJ Qual Improv Rep. 2015 Oct 21;4(1):u209517. Also available: https://dx.doi.org/10.1136/bmjquality.u209517.w3913. PMID: 26734415.
3. Bajracharya P, Summers L, Amatya AK, et al. Implementation of a depression screening protocol and tools to improve screening for depression in patients with diabetes in the primary care setting. J Nurse Pract. 2016 Nov-Dec;12(10):690-7. Also available: http://dx.doi.org/10.1016/j.nurpra.2016.08.009.
4. What are the benefits of health information exchange? [internet]. Washington (DC): HealthIT.gov. The Office of the National Coordinator for Health Information Technology (ONC); 2019 Jan 8 [accessed 2020 Aug 18]. [2 p]. Available: https://www.healthit.gov/faq/what-are-benefits-health-information-exchange.
5. Wiklund ME, Kendler J, Hockberg L, et al. Technical basis for user interface design of health IT. (Prepared by: Vanderbilt University Medical Center under Contract No. SB1341-11-CN-0011). Publication No.: NIST GCR 15-996. Gaithersburg (MD): National Institute of Standards and Technology, U.S. Department of Commerce; 2015 Sep. 192 p. Also available: https://nvlpubs.nist.gov/nistpubs/gcr/2015/NIST.GCR.15-996.pdf.
6. Khorasani R, Hentel K, Darer J, et al. Ten commandments for effective clinical decision support for imaging: enabling evidence-based practice to improve quality and reduce waste. AJR Am J Roentgenol. 2014 Nov;203(5):945-51. Also available: http://dx.doi.org/10.2214/AJR.14.13134. PMID: 25341131.
7. Etter DJ, McCord A, Ouyang F, et al. Suicide screening in primary care: use of an electronic screener to assess suicidality and improve provider follow-up for adolescents. J Adolesc Health. 2018 Feb;62(2):191-7. Also available: http://dx.doi.org/10.1016/j.jadohealth.2017.08.026. PMID: 29195764.
8. Raney L, Bergman D, Torous J, et al. Digitally driven integrated primary care and behavioral health: how technology can expand access to effective treatment. Curr Psychiatry Rep. 2017 Sep 30;19(11):86. Also available: http://dx.doi.org/10.1007/s11920-017-0838-y. PMID: 28965319.
9. Simon GE, Johnson E, Lawrence JM, et al. Predicting suicide attempts and suicide deaths following outpatient visits using electronic health records. Am J Psychiatry. 2018 Oct;175(10):951-60. Also available: https://dx.doi.org/10.1176/appi.ajp.2018.17101167. PMID: 29792051.
10. Kobus AM, Harman JS, Do HD, et al. Challenges to depression care documentation in an EHR. Fam Med. 2013 Apr;45(4):268-71. https://www.stfm.org/familymedicine/vol45issue4/Kobus268. PMID: 23553091.
11. Aleem S, Torrey WC, Duncan MS, et al. Depression screening optimization in an academic rural setting. Int J Health Care Qual Assur. 2015;28(7):709-25. Also available: http://dx.doi.org/10.1108/IJHCQA-01-2015-0012. PMID: 26241092.
12. Madden JM, Lakoma MD, Rusinak D, et al. Missing clinical and behavioral health data in a large electronic health record (EHR) system. J Am Med Inform Assoc. 2016 Nov;23(6):1143-9. Also available: https://dx.doi.org/10.1093/jamia/ocw021. PMID: 27079506.
13. Ranallo PA, Kilbourne AM, Whatley AS, et al. Behavioral health information technology: from chaos to clarity. Health Aff (Millwood). 2016 Jun;35(6):1106-13. Also available: http://dx.doi.org/10.1377/hlthaff.2016.0013. PMID: 27269029.
14. Jetelina KK, Woodson TT, Gunn R, et al. Evaluation of an electronic health record (EHR) tool for integrated behavioral health in primary care. J Am Board Fam Med. 2018 Sep-Oct;31(5):712-23. Also available: https://dx.doi.org/10.3122/jabfm.2018.05.180041. PMID: 30201667.

©2021 ECRI. All Rights Reserved.

Appendix C. Health IT-Enabled Workflow for the Safe Integration of Primary Care and Behavioral Health

This workflow highlights the areas where technology can facilitate the stages of screening, documentation, and sharing that are required for the integration of primary care and behavioral healthcare, regardless of practice setting.

START

1. Visit:
   a. Primary care provider
   b. Behavioral health provider

SCREEN

1. CDS/predictive analytics/timing of care triggers a screening based on last screening, diagnosis, risk factors, other
2. Patient completes screening tools integrated in the EHR (results need to appear)
3. Based on screening tool results, CDS informs care paths and need for behavioral healthcare provider or primary care provider
4. Paths for follow-up
   a. No treatment or follow-up indicated
      i. Visit continues with primary care provider or behavioral healthcare provider, as needed
      ii. Additional screening(s) as appropriate (e.g., annually, per risk factors, diagnosis)
   b. Treatment or follow-up indicated—Go to "Integrate"

INTEGRATE

(The model does not impact the information needed but may impact how the information is sent, viewed, or received.)

1. Behavioral health issue to be internally managed by the primary care provider; or
   a. May transition to next path during primary care management
2. Immediate intervention or follow-up action needed: or
   a. Transfer to appropriate service
3. Behavioral health issue to be managed collaboratively by primary or behavioral healthcare provider; or
   a. Coordinated care[1]
   b. Co-located care[2]
   c. Integrated care[3]
4. Care is provided to the patient regardless of the model used
5. Patient information is available for sharing throughout the treatment process

DOCUMENT

What fields are available, methods for documentation, mapping to standard terminology?

1. Accommodate documentation in the EHR for medical care, behavioral health, psychotherapy
   a. Types/methods/tools for electronically enabled shareable documentation
      i. Standard terminologies
      ii. Standard coded/structured data, shared templates
      iii. Standard templates
      iv. Aggregated information from screenings and assessments
      v. Free-text notes

©2021 ECRI. All Rights Reserved.

b. Considerations for permissible shareable documentation based on: 42 CFR Part 2, HIPAA, state laws and regulations, patient consent
   i. Is information able to be segregated to meet 42 CFR Part 2, state laws/regulations, HCO policies?
   ii. Is the information able to be tagged for segregation or sharing (e.g., prior authorization, billing, referrals)?

1. By clinician?
2. Per organizational policies and computable system rules?

SHARE

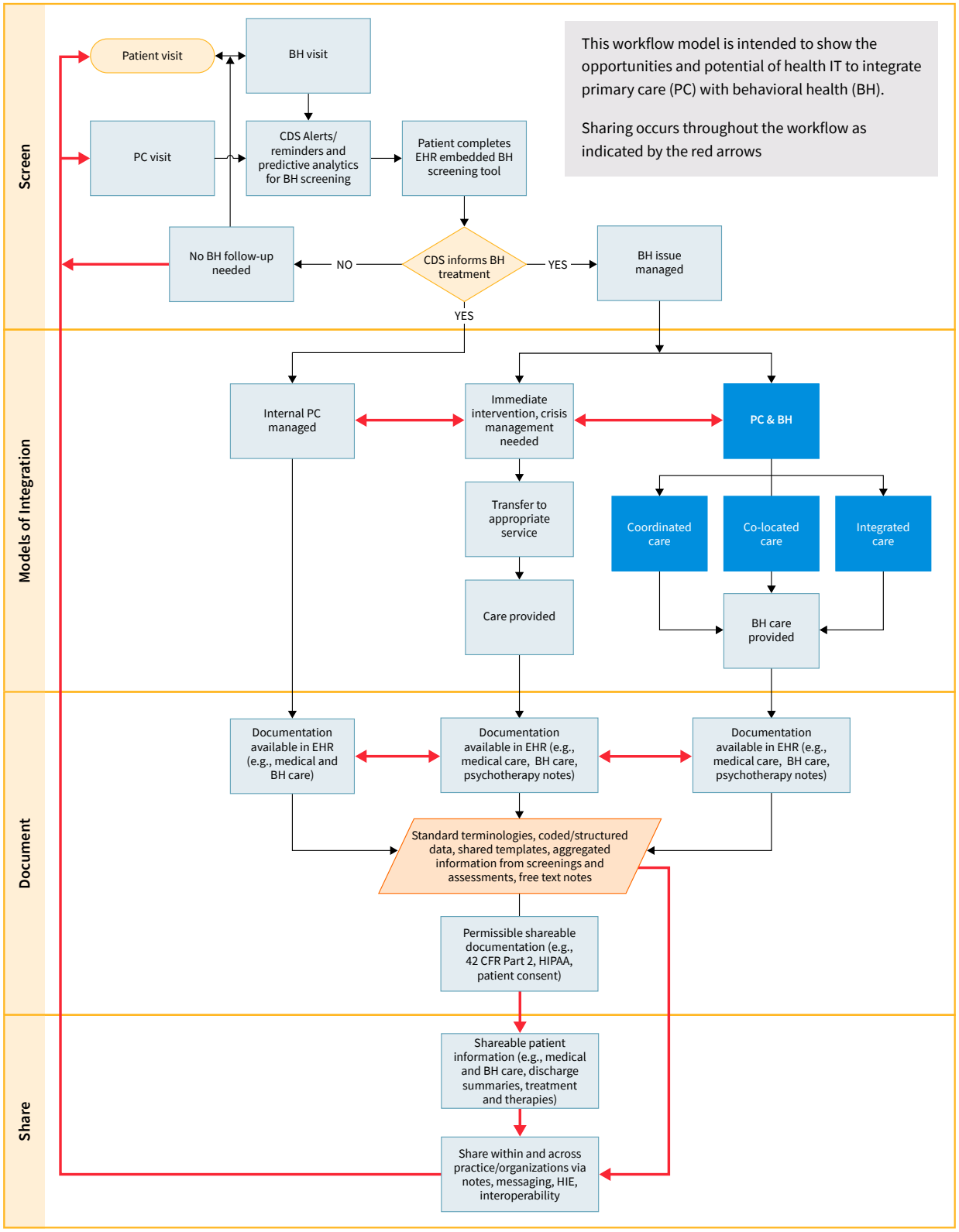
1. Purpose for sharing
   a. Coordinated patient care
      i. Episodic
      ii. Long term
   b. Prior authorization
   c. Billing
   d. Messaging
   e. Referral
2. Types of information to be exchanged
   a. Screening information
   b. Medical history
   c. Behavioral health history
   d. Discharge summaries
   e. Treatment
   f. Therapies
3. Within and across practices/organizations, back to primary care provider and behavioral health provider
   a. Notes
   b. Messaging
   c. HIE
   d. Interoperable
      i. Within HCO
      ii. Across HCOs
4. Auditing capabilities/tracking of information that is shared so internal and external audits, compliance reviews, accountings can be made

CDS, clinical decision support; EHR, electronic health record; HCO, healthcare organization; HIE, health information exchange; HIPAA, Healthcare Insurance Portability and Accountability Act

1. *Minimal collaboration*: Behavioral health and primary care providers work at separate facilities and have separate systems. Communication between providers is minimal. *Basic collaboration at a distance*: Behavioral health and primary care providers maintain separate facilities and separate systems. Providers view each other as resources and communicate periodically about shared patients (i.e., the patient-centered medical home).
2. *Basic collaboration on-site*: Behavioral health and primary care providers are co-located in the same facility, but may or may not share the same practice space. Providers still use separate systems, but communication is more regular due to proximity. *Close collaboration with some system integration*: There is closer collaboration among primary care and behavioral health providers due to co-location, and there is the beginning of integration in care through some shared systems.
3. *Close collaboration approaching an integrated practice*: The behavioral health and primary care providers function as a true team, with frequent personal communication. *Full collaboration in a transformed/merged practice*: Fuller collaboration among providers. Providers and patients view the operation as a single health system treating the whole person. https://www.pcpcc.org/resource/standard-framework-levels-integrated-healthcare#:~:text=A%20Standard%20Framework%20for%20Levels%20of%20Integrated%20Healthcare.,general%20population%2C%20and%20reduce%20per%20capita%20healthcare%20costs

©2021 ECRI. All Rights Reserved.

Health IT-Enabled Workflow for the Safe Integration of Primary Care and Behavioral Health



©2021 ECRI. All Rights Reserved.

Appendix D. Screening Tools Tables

Table 1: Screening Tools Derived from the Patient Health Questionnaire and Patient Stress Questionnaire

Appropriate for Screening for Multiple Mental and Substance Use Disorders[1-3]

Screening Tool	Target Condition	Psychometrics Evaluation				Application in Primary Care Practices	Administration (method and duration)	Population and Gold Standard
		CP	SE%	SP%	G/E			
Patient Health Questionnaire, 15 items (PHQ-15)[4,5] Patient Health Questionnaire, 9 items (PHQ-9)[6,7]	Somatizations syndromes, somatoform symptoms, somatoform disorders	≥6	78	71		Validity in general population,[4] but less sensitive with Latino populations.[8]	Self-and provider-administered in 5-8 minutes	Primary care setting in the Netherlands; measured against SCID
	Major depressive disorder	≥10	88	88	X	Many studies have been conducted to test this screen,[9,10] excellent sensitivity and specificity,[6,11] including for postpartum depression.[10] Can be used without adjustment for Chinese-American, Latino, and African-American sub groups using either English or translated versions.[12] Researchers often shorten (to PHQ-8), excluding item about self-harm and death; item may be important to include in clinical practice.[13]	Designed for self-administration in <5 minutes	Primary care patients measured against clinical interview
General Anxiety Disorder scale, 7 items (GAD-7)[14]	General anxiety disorder (GAD)	≥10	89	82	X	Validated in a general German population.[15] Good sensitivity and specificity for individuals in addiction treatment.[16]	Self-administered in <5 minutes	Primary care clinics; measured against clinical interview
	Panic disorder	≥10	74	81				
	Social anxiety disorder	≥10	72	80				
	Post-traumatic stress disorder (PTSD)	≥10	66	81				
Patient Health Questionnaire, 4 items (PHQ-4)[17]	Depression and anxiety; consists of the first 2 items of the PHQ-9 and GAD-7	≥6 (≥3 for both)			X	Higher PHQ-4 scores strongly associated with increased functional impairment, disability days, health care use.[18] ≥6 Cut point needs evaluation.[18] Validity statistics for PHQ-2 and GAD-2.	Self-administered in <2 minutes	
Patient Health Questionnaire, 2 items (PHQ-2)[4,7,19]	Depression	≥3	83	92	X	Excellent sensitivity for postpartum depression.[7] Study in exclusively primary care clinics found lower sensitivity for the PHQ-2 than original validation study.[7]	Self-administered in <2 minutes	Primary care and obstetrics-gynecology clinics; measured against clinical interview

©2021 ECRI. All Rights Reserved.

Screening Tool	Target Condition	Psychometrics Evaluation				Application in Primary Care Practices	Administration (method and duration)	Population and Gold Standard
		CP	SE%	SP%	G/E			
General Anxiety Disorder scale, 2 items (GAD-2)[20]	GAD	≥3	86	83	X	Screening for anxiety in primary care also is recommended.[20]	Self-administered in <2 minutes	Primary care clinic; measured against clinical interview
	Panic disorder	≥3	76	81	X			
	Social anxiety disorder	≥3	70	81				
	PTSD	≥3	59	81				
Alcohol Use Disorders Identification Test, 10 items (AUDIT-10)2112/8/2004	Hazardous alcohol use	≥8	97	78	X	Evidence suggests computerized versions work well.[22,23] Much less sensitive for detecting heavy drinking/alcohol use disorders.[24] Identifies alcohol problems in primary care and emergency room settings among white, black, and Latino subgroups.[25] less sensitive among female than male populations.[25,26]	Provider-administered in 3 minutes	Community physicians' offices, hospital-based clinics, and community health centers
	Harmful alcohol use	≥8	95	85	X			
Alcohol Use Disorders Identification Test-Short Form (AUDIT-C), [3] items[17]	Hazardous drinkers	≥4 for men ≥3 for women	86	78	X	Women have lower threshold for screening than men.[26,27]	Self-or provider-administered in 1-2 minutes, but requires provider scoring (complicated without EHR or (automated scoring methods).[26,27]	Primary care sample; measured against standardized interviews
PC-PTSD-5[3]	PTSD	≥5	95	85	X	Demonstrates strong diagnostic accuracy. Sample were Veterans, predominantly male, > 60, with the majority identified as non-Hispanic White.	Self-or provider administered in <5 minutes. Patients preferred administration by the primary care provider or via self-report.	Measured against DSM-IV PTSD module of the MINI was used to assess the DSM-% criteria
SUBS-4 Items[28]	Unhealthy use:					Good test-retest reliability, sensitivity, and specificity for detection of past-year unhealthy use of tobacco, alcohol, and other drugs in primary care patients. Generated valid results in a diverse population.	Self-administered <2 minutes	
	— Tobacco		97.8	95.7	X			
	— Alcohol		85.2	77	X			
	— Illicit Drugs		82.5	91	X			
	— Prescription Drugs		82.5	91	X			
	SUBS:							
	— Tobacco		100	72	X			
	— Alcohol		93.5	64.6	X			
	— Drugs		87.5	82	X			

Abbreviations: CP, cut point (the point which classifies most of the individuals correctly and thus least of them incorrectly)[29]; SE, sensitivity (the ability of a test to correctly identify patients with a disease)[30]; SP, specificity (the ability of a test to correctly identify people without the disease)[30]; G/E good or excellent; SCID, Structured Clinical Interview for DSM

©2021 ECRI. All Rights Reserved.

Table 2: Multiple-Disorder Screening Tools Assessing Either Mental Disorders or Substance Use Disorders in a Single Instrument

Not Derived From the Patient Health Questionnaire and Patient Stress Questionnaire[1,2]

Screening Tool	Target Condition	Psychometrics Evaluation				Application in Primary Care Practices	Administration (method and duration)	Population and Gold Standard
		CP	SE%	SP%	G/E			
Mental Disorders Hospital Anxiety and Depression Scale (HADS)[31]	Combined, 14 items	≥8	80	93	X	For depression, does not perform as well as the PHQ-9 in primary care settings.[32] Originally developed for patients with significant physical health problems. Extensive testing but primarily in non-psychiatric hospital settings.[31]	Self-administered in <5 minutes	Meta-analysis of studies Primary care patients; measured against CIS
	Anxiety (HADS-A), 7 items	≥9	66					
	Depression (HAD-D), 7 items	≥8 ≥7	80 66	97	X			Meta-analysis Primary care patients; measured against CIS
Web-Based Depression and Anxiety Test (WB-DAT).[33] 11 gating questions and additional items depending on response	Major depressive disorder		79	89	X	Initial psychometrics conducted with small sample. Limited evaluation of psychometrics in primary care settings. Cut points determined by algorithm in web-based program and not published.	Self-administered on web >5 minutes	Research subjects at clinical research center; measured against the SCID
	Panic disorder ± agoraphobia		75	94	X			
	Social phobia/ social anxiety disorder		74	94				
	OCD		71	97				
	Generalized anxiety disorder		63	94				
	Post-traumatic stress disorder		95	83	X			
	Any anxiety disorder		89	86	X			
	Any disorder		86	86	X			
Substance Use Disorders Kreek-McHugh-Schluger-Kellogg (KMSK) scale[34]	Combined, 28 items					Assesses frequency, amount, and duration of use but not degree of resulting functional problems. Includes tobacco module. Identifies self-exposure. Predicts dependence among urban, low-income, and predominantly African-American groups of primary care patients.[35]	Provider-administered in 5-10 minutes, depending on the number of substances used	Research volunteers in a genetics project; measured against the SCID
	Opioids, 8 items	≥9	100	99	X			
	Cocaine, 7 items	≥11	97	94	X			
	Alcohol, 6 items	≥11	90	90	X			
Simple Screening Instrument for Substance Abuse Potential (SISAP),[36,37] 5 items	Overall risk of alcohol or drug dependence or abuse	≥5	91	78	X	Allows general practice physicians treating patients with pain top identify individuals at risk of prescription opioid abuse.	Self-and provider-administered and scored in <1 minute	Individuals with history of drug/alcohol use disorder; measured against the population-based NADS

©2021 ECRI. All Rights Reserved.

Screening Tool	Target Condition	Psychometrics Evaluation				Application in Primary Care Practices	Administration (method and duration)	Population and Gold Standard
		CP	SE%	SP%	G/E			
Drug Abuse Screen Test (DAST-10),[38,39] 10 items	Problems with drug use, not including alcohol or tobacco	≥3	85	78	X	Good to excellent psychometric for assessing drug use disorders. Self-report may mitigate stigma. Lower cut point may be needed to maximize sensitivity with drug abusers.[39] May be less effectively with incarcerated women.[40]	Self-administered in <5 minutes	Psychiatric outpatients with serious mental illness; measured against diagnosis of abuse or dependence
Tobacco, Alcohol, Prescription Medication and Other Substance Use (TAPS) tool,[41] 4 screener questions with up to 8 follow-up, depending on use	Alcohol	≥1	74	79		Recently developed tool still undergoing testing and refinement in multiple populations.[41] The 4-item screener alone is an effective short screen for "unhealthy substance use."[42]	Designed for self-or interviewer administration. Time to complete varies depending on mode of administration and number of substances use disorder.	Primary care patients; measured against the CIDI with oral fluid testing
	Prescription opioids	≥1	71	99				
	Heroine	≥1	78	100	X			
	Cocaine	≥1	68	99				
	Sedative	≥1	63	99				
	Marijuana	≥1	82	93	X			
Alcohol, Smoking, and Substance Involvement Screening Test (ASSIST),[43] 8 items	Global risk	≥14.5	80	71		Determines low, moderate, or high risk for each substance to start a discussion (brief interventions) with clients. More robust discriminator between use and abuse than abuse and dependence. Poor sensitivity and specificity for abuse vs. dependence. Extensive testing in urban outpatient settings.[44] Successfully adapted for audio-guided, computer-assisted self-interview.[45]	Provider-administered in 5-15 min, depending on number of substances used.	One-third from specialty drug treatment settings and two-thirds form primary care settings in 7 countries around the world using discriminant validity between use and abuse; measured against ICE and MINI-Plus
	Alcohol	≥5.5	83	79	X			
	Cannabis	≥1.5	91	90	X			
	Cocaine	≥0.5	92	94	X			
	ATS	≥0.5	97	87	X			
	Sedatives	≥0.5	94	91	X			
	Opioids	≥0.5	94	96	X			
	Global illicit	≥6.5	88	89	X			

Abbreviations: CP, cut point[29]; SE, sensitivity[30]; SP, specificity[30]; G/E good or excellent; ATS, amphetamine-type stimulants; CIS, Clinical Interview Schedule; ICE, Independent Clinical Evaluation; MINI-Plus, Mini-International Neuropsychiatric Interview-Plus; NADS, National Anti-Drug Strategy; OCD, obsessive-compulsive disorder; SCID, Structured Clinical Interview for DSM; CID, Composite International Diagnostic Interview for DSM

Tools selected:

- Assessed publicly available, nonpropriety tools that screen for anxiety, depression, and substance use disorder
- Had undergone psychometric testing
- Targeted adult over age 18
- Studied in English in North America or Western Europe

The strength of the tool was validated based on:

- Measurement against a strong gold standard (e.g., a clinical interview)
- The tools sensitivity and specificity was tested in primary care settings
- The sensitivity and specificity both exceed 75%

©2021 ECRI. All Rights Reserved.

References

1. Mulvaney-Day N, Marshall T, Downey Piscopo K, Korsen N, Lynch S, Karnell LH, Moran GE, Daniels AS, Ghose SS. Screening for behavioral health conditions in primary care settings: a systematic review of the literature. J Gen Intern Med. 2018 Mar;33(3):335-46. Also available: http://dx.doi.org/10.1007/s11606-017-4181-0. PMID: 28948432.
2. Zimmerman M, Coryell W, Black DW. A method to detect intercenter differences in the application of contemporary diagnostic criteria. J Nerv Ment Dis. 1993 Feb;181(2):130-4. PMID: 8426170.
3. Prins A, Bovin MJ, Smolenski DJ, Marx BP, Kimerling R, Jenkins-Guarnieri MA, Kaloupek DG, Schnurr PP, Kaiser AP, Leyva YE, Tiet QQ. The primary care PTSD screen for DSM-5 (PC-PTSD-5): development and evaluation within a veteran primary care sample. J Gen Intern Med. 2016 Oct;31(10):1206-11. Also available: http://dx.doi.org/10.1007/s11606-016-3703-5. PMID: 27170304.
4. Kocalevent RD, Hinz A, Brähler E. Standardization of a screening instrument (PHQ-15) for somatization syndromes in the general population. BMC Psychiatry. 2013 Mar 20;13:91. Also available: http://dx.doi.org/10.1186/1471-244X-13-91.
5. van Ravesteijn H, Wittkampf K, Lucassen P, van de Lisdonk E, van den Hoogen H, van Weert H, Huijser J, Schene A, van Weel C, Speckens A. Detecting somatoform disorders in primary care with the PHQ-15. Ann Fam Med. 2009 May-Jun;7(3):232-8. Also available: http://dx.doi.org/10.1370/afm.985.
6. Kroenke K, Spitzer RL, Williams JB. The PHQ-9: validity of a brief depression severity measure. J Gen Intern Med. 2001 Sep;16(9):606-13. Also available: https://doi.org/10.1046/j.1525-1497.2001.016009606.x. PMID: 11556941.
7. Ebell MH. Screening instruments for depression. Am Fam Physician. 2008 Jul 15;78(2):244-6.
8. Interian A, Allen LA, Gara MA, Escobar JI, Diaz-Martinez AM. Somatic complaints in primary care: further examining the validity of the patient health questionnaire (PHQ-15). Psychosomatics. 2006 Sep-Oct;47(5):392-8. PMID: 16959927.
9. Kroenke K, Spitzer RL, Williams JB, Lowe B. The patient health questionnaire somatic, anxiety, and depressive symptom scales: a systematic review. Gen Hosp Psychiatry. 2010 Jul-Aug;32(4):345-59. Also available: https://doi.org/10.1016/j.genhosppsych.2010.03.006. PMID: 20633738.
10. Gjerdingen D, Crow S, McGovern P, Miner M, Center B. Postpartum depression screening at well-child visits: validity of a 2-question screen and the PHQ-9. Ann Fam Med. 2009 Jan-Feb;7(1):63-70. Also available: http://dx.doi.org/10.1370/afm.933.
11. Arroll B, Goodyear-Smith F, Crengle S, Gunn J, Kerse N, Fishman T, Falloon K, Hatcher S. Validation of PHQ-2 and PHQ-9 to screen for major depression in the primary care population. Ann Fam Med. 2010 Jul-Aug;8(4):348-53. Also available: http://dx.doi.org/10.1370/afm.1139. PMID: 20644190.
12. Huang FY, Chung H, Kroenke K, Delucchi KL, Spitzer RL. Using the patient health questionnaire-9 to measure depression among racially and ethnically diverse primary care patients. J Gen Intern Med. 2006 Jun;21(6):547-52. PMID: 16808734.
13. Uebelacker LA, German NM, Gaudiano BA, Miller IW. Patient health questionnaire depression scale as a suicide screening instrument in depressed primary care patients: a cross-sectional study. Prim Care Companion CNS Disord. 2011;13(1):PCC.10m01027. Also available: http://dx.doi.org/10.4088/PCC.10m01027. PMID: 21731830.
14. Benjamin S, Herr NR, McDuffie J, Nagi A, Williams, JW Jr. Performance characteristics of self-report instruments for diagnosing generalized anxiety and panic disorders in primary care: a systematic review. (Prepared by: Evidence-based Synthesis Program (ESP), Durham Veterans Affairs Healthcare System). Washington (DC): Department of Veterans Affairs, Veterans Health Administration; 2011 Aug. 57 p. PMID: 22206106.
15. Benjamin S, Herr NR, McDuffie J, Nagi A, Williams JW Jr, Löwe B, Decker O, Müller S, Brähler E, Schellberg D, Herzog W, Herzberg PY. Validation and standardization of the generalized anxiety disorder screener (GAD-7) in the general population. Med Care. 2011 Aug;46(3):266-74. Also available: http://dx.doi.org/10.1097/MLR.0b013e318160d093. PMID: 18388841.
16. Delgadillo J, Payne S, Gilbody S, Godfrey C, Gore S, Jessop D, Dale V. Brief case finding tools for anxiety disorders: validation of GAD-7 and GAD-2 in addictions treatment. Drug and Alcohol Dependence. 2012 Sep;125(1-2):37-42. Also available: http://dx.doi.org/10.1016/j.drugalcdep.2012.03.011. PMID: 22480667.
17. Löwe B, Wahl I, Rose M, Spitzer C, Glaesmer H, Wingenfeld K, Schneider A, Brähler E. A 4-item measure of depression and anxiety: validation and standardization of the patient health questionnaire-4 (PHQ-4) in the general population. J Affect Disord. 2010 Apr;122(1-2):86-95. Also available: http://dx.doi.org/10.1016/j.jad.2009.06.019. PMID: 19616305.
18. Kroenke K, Spitzer RL, Williams JB, Löwe B. An ultra-brief screening scale for anxiety and depression: the PHQ-4. Psychosomatics. 2009 Nov-Dec;50(6):613-21. Also available: https://doi.org/10.1016/S0033-3182(09)70864-3. PMID: 19996233.
19. Kroenke K, Spitzer RL, Williams JB. The patient health questionnaire-2: validity of a two-item depression screener. Med Care. 2003 Nov;41(11):1284-92. PMID: 14583691.
20. Kroenke K, Spitzer RL, Williams JB, Monahan PO, Lowe B. Anxiety disorders in primary care: prevalence, impairment, comorbidity, and detection. Ann Intern Med. 2007 Mar 6;146(5):317-25. PMID: 17339617.
21. Saunders JB, Aasland OG, Babor TF, de la Fuente JR, Grant M. Development of the alcohol use disorders identification test (AUDIT): WHO collaborative project on early detection of persons with harmful alcohol consumption--II. Addiction. 1993 Jun;88(6):791-804. PMID: 8329970.
22. Chan-Pensley E. Alcohol-use disorders identification test: a comparison between paper and pencil and computerized versions. Alcohol Alcohol. 1999 Nov-Dec;34(6):882-5. Also available: http://dx.doi.org/10.1093/alcalc/34.6.882. PMID: 10659724.
23. Kypri K, Saunders JB, Williams SM, McGee RO, Langley JD, Cashell-Smith ML, Gallagher SJ. Web-based screening and brief intervention for hazardous drinking: a double-blind randomized controlled trial. Addiction. 2004 Nov;99(11):1410-7. PMID: 15500594.
24. Fiellin DA, Reid MC, O'Connor PG. Screening for alcohol problems in primary care: a systematic review. Arch Intern Med. 2000 Jul 10;160(13):1977-89. PMID: 10888972.

©2021 ECRI. All Rights Reserved.

25. Allen JP, Reinert DF, Volk RJ. The alcohol use disorders identification test: an aid to recognition of alcohol problems in primary care patients. Prev Med. 2001 Nov;33(5):428-33. Also available: http://dx.doi.org/10.1006/pmed.2001.0910. PMID: 11676584.

26. Bradley KA, DeBenedetti AF, Volk RJ, Williams EC, Frank D, Kivlahan DR. AUDIT-C as a brief screen for alcohol misuse in primary care. Alcohol Clin Exp Res. 2007;31(7):1208-17. PMID: 17451397.

27. Kaarne T, Aalto M, Kuokkanen M, Seppä K. AUDIT-C, AUDIT-3 and AUDIT-QF in screening risky drinking among Finnish occupational health-care patients. Drug Alcohol Rev. 2010 Sep;29(5):563-7. Also available: http://dx.doi.org/10.1111/j.1465-3362.2010.00172.x. PMID: 20887582.

28. McNeely J, Strauss SM, Saitz R, Cleland CM, Palamar JJ, Rotrosen J, Gourevitch MN. A brief patient self-administered substance use screening tool for primary care: two-site validation study of the substance use brief screen (SUBS). Am J Med. 2015 Jul;128(7):784.e9-19. Also available: http://dx.doi.org/10.1016/j.amjmed.2015.02.007. PMID: 25770031.

29. Perkins NJ, Schisterman EF. The inconsistency of "optimal" cutpoints obtained using two criteria based on the receiver operating characteristic curve. Am J Epidemiol. 2006 Apr 1;163(7):670-5. Also available: http://dx.doi.org/10.1093/aje/kwj063. PMID: 16410346.

30. Swift A, Heale R, Twycross A. What are sensitivity and specificity? Evid Based Nurs. 2020 Jan;23(1):2-4. Also available: http://dx.doi.org/10.1136/ebnurs-2019-103225. PMID: 31719126.

31. Bjelland I, Dahl AA, Haug TT, Neckelmann D. The validity of the hospital anxiety and depression scale: an updated literature review. J Psychosom Res. 2002;52(2):69-77. PMID: 11832252.

32. Löwe B, Kroenke K, Herzog W, Gräfe K. Measuring depression outcome with a brief self-report instrument: sensitivity to change of the patient health questionnaire (PHQ-9). J Affect Disord. 2004 Jul;81(1):61-6. Also available: http://dx.doi.org/10.1016/S0165-0327(03)00198-8. PMID: 15183601.

33. Farvolden P, McBride C, Bagby RM, Ravitz P. A web-based screening instrument for depression and anxiety disorders in primary care. J Med Internet Res. 2003 Jul-Sep;5(3):e23. Also available: http://dx.doi.org/10.2196/jmir.5.3.e23. PMID: 14517114.

34. Kellogg SH, McHugh PF, Bell K, Schluger JH, Schluger RP, LaForge KS, Ho A, Kreek MJ. The Kreek-McHugh-Schluger-Kellogg scale: a new, rapid method for quantifying substance abuse and its possible applications. Drug Alcohol Depend. 2003 Mar;69(2):137-50. PMID: 12609695.

35. Tang YL, Khoury L, Bradley B, Gillespie CF, Ressler KJ, Cubells JF. Substance use disorders assessed using the Kreek-McHugh-Schluger-Kellogg (KMSK) scale in an urban low-income and predominantly African American sample of primary care patients. Am J Addict. 2011 May-Jun;20(3):292-9. Also available: http://dx.doi.org/10.1111/j.1521-0391.2011.00121.x. PMID: 21477058.

36. Jamison RN, Serraillier J, Michna E. Assessment and treatment of abuse risk in opioid prescribing for chronic pain. Pain Res Treat. 2011;2011:941808. Also available: http://dx.doi.org/10.1155/2011/941808. PMID: 22110936.

37. McPherson TL, Hersch RK. Brief substance use screening instruments for primary care settings: a review. J Subst Abuse Treat. 2000 Mar;18(2):193-202. PMID: 10716103.

38. Maisto SA, Carey MP, Carey KB, Gordon CM, Gleason JR. Use of the AUDIT and the DAST-10 to identify alcohol and drug use disorders among adults with a severe and persistent mental illness. Psychol Assess. 2000 Jun;12(2):186-92. Also available: http://dx.doi.org/10.1037//1040-3590.12.2.186. PMID: 10887764.

39. Yudko E, Lozhkina O, Fouts A. A comprehensive review of the psychometric properties of the drug abuse screening test. J Subst Abuse Treat. 2007 Mar;32(2):189-98. PMID: 17306727.

40. Saltstone R, Halliwell S, Hayslip MA. A multivariate evaluation of the Michigan alcoholism screening test and the drug abuse screening test in a female offender population. Addict Behav. 1994 Sep-Oct;19(5):455-62. PMID: 7832004.

41. McNeely J, Wu LT, Subramaniam G, Sharma G, Cathers LA, Svikis D, Sleiter L, Russell L, Nordeck C, Sharma A, O'Grady KE, Bouk LB, Cushing C, King J, Wahle A, Schwartz RP. Performance of the tobacco, alcohol, prescription medication, and other substance use (TAPS) tool for substance use screening in primary care patients. Ann Intern Med. 2016 Nov 15;165(10):690-9. Also available: http://dx.doi.org/10.7326/M16-0317. PMID: 27595276.

42. Gryczynski J, McNeely J, Wu LT, Subramaniam GA, Svikis DS, Cathers LA, Sharma G, King J, Jelstrom E, Nordeck CD, Sharma A, Mitchell SG, O'Grady KE, Schwartz RP. Validation of the TAPS-1: a four-item screening tool to identify unhealthy substance use in primary care. J Gen Intern Med. 2017 May 26;32(9):990-6. Also available: http://dx.doi.org/10.1007/s11606-017-4079-x. PMID: 28550609.

43. Humeniuk R, Ali R. Validation of the alcohol, smoking and substance involvement screening test (ASSIST) with pilot brief intervention, a technical report of phase II findings of the WHO ASSIST project. Geneva, Switzerland: World Health Organization (WHO); 2006. 125 p. Also available: https://www.who.int/substance_abuse/activities/assist_technicalreport_phase2_final.pdf.

44. Lee JD, Delbanco B, Wu E, Gourevitch MN. Substance use prevalence and screening instrument comparisons in urban primary care. Subst Abus. 2011 Jul;32(3):128-34. PMID: 21660872.

45. Kahler CW, Pantalone DW, Mastroleo NR, Liu T, Bove G, Ramratnam B, Monti PM, Mayer KH. Motivational interviewing with personalized feedback to reduce alcohol use in HIV-infected men who have sex with men: a randomized controlled trial. J Consult Clin Psychol. 2018 Aug;86(8):645-56.

©2021 ECRI. All Rights Reserved.

Appendix E. Behavioral Health Exchange Data Elements

Data Elements (Demographic, Clinical, and Administrative)	Admission to or discharge from emergency services	Visit to the primary care provider	Transition between behavioral health clinician and primary care provider	Coordination among behavioral health clincian (e.g., Psychiatrist, psychologist, psychotherapist, social worker, etc.)	Transition between psychiatric hospital or unit (inpatient or outpatient) and community behavioral health clinician	Coordination of care between non-behavioral specialist clinician and behavioral health clinician
Individual name	••	••	••	••	••	••
Address, Zip code		••	••	••	••	••
Date of birth	••	••	••	••	••	••
Maiden name	••	••	••	••	••	••
Preferred language	••	••	••	••	••	••
Gender identity	••	••	••	••	••	••
Sexual orientation		••	••	••	••	
Sex (birth sex)	••	••	••	••	••	
Race		••	••	••	••	
Ethnicity		••	••	••	••	••
Spouse		••	••		••	••
Children		••	••		••	••
Education		••	••			
Employment		••	••	••	••	
Emergency contact	••	••	••	••	••	••
Transportation		••	••	••	••	••
Medications (prescriber)	••	••	••	••	••	••
Medical history	••	••	••	••	••	••
Medication allergies	••	••	••	••	••	••
Current primary care provider	••			••		••
Previously prescribed ineffective meds	••	••	••	••	••	••
Previous admissions	••	••	••	••	••	••
Current problem list	••	••	••	••	••	••
Crisis plan/mental health advance directive	••	••	••	••	••	••
Problems	••	••	••	••	••	••
Drug use, misuse, risk factors/history	••	••	••	••	••	••
Substance abuse treatment provider	••	••	••	••	••	••
Laboratory test		••	••	••		••
Electrocardiogram		••	••	••		••
Laboratory values		••	••	••		••
Vital signs		••	••			••
Advance directive	••	••	••	••		••
Discharge instructions	••	••	••	••	••	••
Assessment and plan of treatment		••	••	••	••	••
ISP-(individual service plan) from community agency	••	••	••	••		
Power of attorney or medical power of attorney	••	••	••	••	••	••
Guardianship status	••	••	••	••	••	••
Foster children		••	••			
Incarcerated	••	••	••	••		
Competency issues, particularly for emergency issues	••	••	••	••	••	••
Status of release of information preferences	••	••	••	••		
Court orders	••	••	••	••	••	

©2021 ECRI. All Rights Reserved.

Appendix F. Behavioral Health Data Domain

Domain	Topic	Relevant Standards
General	Patient demographics	HL7®, ONC-ISA
	Patient vital signs	HL7®, LOINC®
	Patient consent	HL7®
	Patient reported data	NA
	Scheduling	HL7® (Note: not in ISA)
Clinical	Problems/diagnosis	HL7®, ONC-ISA, LOINC®, SNOMED-CT®
	Disorders	HL7®, SNOMED-CT®, ICD-10-CM, DSM-5 (Note: assume same as problems/Dx)
	Drug toxicology	HL7®, LOINC® (Note: assume same as lab results)
	Lab results	HL7®, ONC-ISA, LOINC®
	Radiology results	HL7®, LOINC®, SNOMED-CT®
	Procedures	HL7®, ICD-10-CM, LOINC®, CPT-4, SNOMED-CT®
	Pharmacy orders	HL7®, ICD-10-CM
	Medications	HL7®, ONC-ISA, LOINC®, SNOMED-CT®, RxNorm®, NDC
	Clinical notes	HL7®
Episode	Patient administration	HL7®, ONC-ISA, LOINC®
	Assessment	HL7®
	Treatment plan	HL7®, LOINC®
	Referral/authorizations	HL7®, HITSP, LOINC®
	Program enrollment	HL7®
Billing	Eligibility	X12, HL7®
	Claims & reimbursement	X12, HL7®
Infrastructure	Transport methods	HL7®, CDISC (Note: high for IHE is correct and Push, medium for FHIR®)
Terminology	Value sets	HL7®, CTS, LOINC®, SNOMED-CT®, ICD-10-CM, DSM-5, HCPCS, RxNorm®, API, PHIN, VADS, CPT-4
	Security/privacy	HL7® (Note: Not evaluated ISA)
	HIE integration	Sequoia, IHE (Same as Transport Methods)

Key: Approximate Standards Maturity Level

Uses Likert scale with 1 as low adoption through 5 as high adoption

Production and high adoption (5/5, 4/5)	Production and medium or uncertain adoption (2/5, 3/5)	Pilot and/or low adoption (1/5)

From ONC ISA June 24, 2020; notes added. **Adapted from:** CBCP releases. [internet]. GForge; Available: https://gforge.hl7.org/gf/project/cbcc/frs/.

©2021 ECRI. All Rights Reserved.

PARTNERSHIP *for*
HEALTH IT PATIENT SAFETY
a national collaborative

Convened by

ECRI

EHRA HIMSS ELECTRONIC HEALTH RECORD ASSOCIATION

With funding from
GORDON AND BETTY MOORE FOUNDATION