

*Final Report*

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# **Barriers to Meaningful Use in Medicaid**

## **Analysis and Recommendations**

**Prepared for:**

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**Contract No. HHS A290200710079T**

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**AHRQ Publication No. 12-0062-EF**  
**August 2012**



Agency for Healthcare Research and Quality  
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**HEALTH IT**

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**Suggested Citation:**

Kissam SM, Banger AK, Dimitropoulos LL, Thompson CR. Barriers to Meaningful Use in Medicaid: Analysis and Recommendations. (Prepared by RTI International, under Contract No. HHS A290200710079T.) AHRQ Publication No. 12-0062-EF. Rockville, MD: Agency for Healthcare Research and Quality. August 2012.

**None of the investigators has any affiliations or financial involvement that conflicts with the material presented in this report.**

This project was funded by the Agency for Healthcare Research and Quality (AHRQ), U.S. Department of Health and Human Services. The opinions expressed in this document are those of the authors and do not reflect the official position of AHRQ or the U.S. Department of Health and Human Services.

## Acknowledgments

The authors acknowledge the contributions of Sean Hogan, Ph.D., formerly at RTI International, for his early work on the study design and data collection instruments. We also acknowledge Jennifer Webb, Health IT Scientist, Center for the Advancement of Health IT at RTI International, for her help with additional literature review. We thank John Marks of West Virginia Medical Institute for his leadership on the pilot work, and Patricia Ruddick of West Virginia Medical Institute and Patricia MacTaggart of George Washington University for their assistance in facilitating focus groups.

We also acknowledge the contributions of our technical expert panel who provided review of the study design, data collection instruments, and analysis: Cindy Brach (AHRQ), Lawrence Clark (CMS), Doug Fridsma (ONC), Erin Grace (AHRQ), Yael Harris (HRSA), Jessica Kahn (CMS), Mat Kendall (ONC), Anna Poker (HRSA), and Josh Seidman (ONC).

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## Executive Summary

Health information technologies (health IT), including electronic health records (EHRs), have the potential to improve the quality, safety, and efficiency of care. However, some research suggests that having a predominantly Medicaid-insured population may negatively influence the adoption and use of EHRs. Given that Medicaid serves approximately 58 million medically and financially vulnerable citizens, it is important to understand whether programs designed to promote the adoption and Meaningful Use (MU) of EHRs will be effective in promoting adoption and MU among providers of who serve largely Medicaid beneficiaries. This study focused on identifying barriers to achieving MU of EHRs unique to health care professionals that serve high proportions of Medicaid-insured individuals and specifically examined whether work environment-related factors or characteristics of the population they serve created barriers to adopting and using EHRs. The study also examined whether the financial incentives offered through the Medicaid EHR Incentive Program and available technical assistance offerings were sufficient to mitigate the barriers that Medicaid providers face in achieving MU.

To answer these questions, we conducted 17 focus groups composed of 68 health care professionals eligible for the Medicaid EHR Incentive Program. The 17 groups included 12 groups of EHR adopters and 5 groups of nonadopters. Study participants included a mix of adult medicine physicians, pediatricians, nurse practitioners, physician assistants, certified nurse midwives, and dentists who were asked about their experiences with specific barriers and enabling factors to adopting and using EHRs. The goals were to develop findings and recommendations to inform current and future policy related to MU of EHRs among Medicaid providers.

*Findings:* The reported barriers to adoption and MU of EHRs were not associated with serving a predominately Medicaid-insured population, and were consistent with barriers that health care professionals in other studies had previously reported. In fact, barriers to adopting and using EHRs that could be associated with Medicaid providers were issues specific to provider types who were eligible for the Medicaid EHR Incentive Program but not the Medicare EHR Incentive Program, specifically, dentists and pediatricians. However, all findings were useful in generating a set of recommendations that *are* specific to promoting MU of EHRs among health care professionals eligible for the Medicaid EHR Incentive Program, as outlined below.

Participants reported variable awareness of the Medicaid EHR Incentive Program. Key findings focused on awareness of the program and its influence on adoption and MU of EHRs:

- There are informational barriers to participating in the Medicaid EHR Incentive Program. Participants reported receiving information about the Medicaid EHR Incentive Program from many sources, but preferred to get more information from a government agency rather than an EHR vendor.
- The influence of the Medicaid EHR Incentive Program is mixed. Many EHR adopters reported that the opportunity to receive payments through the Medicaid EHR Incentive Program motivated them to use their EHR in specific ways, while other adopters and nonadopters reported that the decision to adopt or not adopt EHRs was not influenced by the financial incentives. These adopters stated that they would use

EHRs anyway, while the nonadopters said that the amount of incentive would still not make EHR use affordable to them.

- Many EHR adopters cited certification of EHRs as an important factor in their decision to adopt or transition to a new system, but sometimes assumed that certification would guarantee the quality or usability of the EHR.

With regard to adopting EHRs, findings focused on the process of selecting an EHR that met the provider's needs:

- Participants reported seeking information from a wide range of sources, and usually used multiple sources of information. Professional colleagues and Internet searches were the most frequent sources of information for EHR selection. These resources were cited more often than Regional Extension Centers (RECs) that exist in every State to help providers adopt and implement EHRs and help them achieve MU. However, when RECs were cited as an information source, participants were very satisfied with the technical assistance provided.
- Dentists reported difficulty finding a certified EHR product suitable for their practices. Family medicine practitioners reported challenges in finding an EHR that was suitable for the entire life span, from pediatrics to geriatrics.
- Nonadopters of EHRs anticipated several benefits to EHRs, including cost and time savings, that did not align with the reported experiences of adopters, who frequently mentioned concerns about the ongoing maintenance costs of EHRs, loss of productivity, and increased time to document clinical information in EHRs compared with paper charts.

With regard to implementing EHRs, reported barriers focused mostly on the ways in which an EHR did not function well in the course of providing clinical care and required frequent workarounds and additional time—without the benefit of being able to transfer electronic health information to other providers in the community:

- Switching to an EHR can require providers to reconfigure their thought and practice patterns. Many EHR adopters expressed frustration at the added time they felt it took to document accurate clinical information in an EHR in an understandable way.
- Providers, particularly pediatricians, noted both positive and negative aspects of using structured data fields. For example, they provide a method for tracking information such as blood pressure or weight over time, but can be limiting in circumstances where the right unit of measure, drug, or diagnosis is not available in the system.
- Participants also reported that EHRs negatively impact patient-provider interactions due to the need to focus on the computer screen rather than look at the patient.
- Participants were frustrated at the lack of interoperability across different EHR systems in their community. They saw the potential value of health information exchange (HIE) with providers outside of their own practices as a main benefit to using EHRs, but did not yet have the option of exchanging information electronically. Among participants who had worked with their RECs during the process of EHR implementation, all reported positive experiences. However, only a minority of participants had worked with their local REC.

With regard to barriers to achieving MU of EHRs, many participants reported that they were not currently meeting one or more of the Stage 1 MU objectives:

- A significant number of participants reported not using three of the core measures:
  - Provide clinical decision support.



- Provide electronic copy of health information on request.
- Provide clinical summaries of the office visit).
- Similarly, more participants reported *not* using at least six menu set objectives (than using them):
  1. Implement drug formulary check system.
  2. Incorporate laboratory test results into EHRs as structured data.
  3. Use the EHR to provide patient-specific educational resources.
  4. Perform medication reconciliation at transitions in care.
  5. Send patient reminders.
  6. Provide patients with timely electronic access to their health information.
- Some participants reported that some characteristics of their patient population may influence whether they achieve MU of EHRs, but that these characteristics were not necessarily limited to their Medicaid-insured patients. For example, having limited or no Internet access may impede patients' ability to access health information online, and speaking or reading a language other than English may make the distribution of patient educational resources less relevant.

The findings of this study suggest four major recommendations:

**Recommendation 1: Promote a more proactive approach by Medicaid agencies to assist Medicaid providers in achieving MU. State Medicaid agencies should—**

- Provide direct communication about the requirements of the Medicaid EHR Incentive Program. Since providers reported receiving information from multiple sources, with a preference for government-sponsored communications, Medicaid agencies should seek channels of communication that reach providers at different times and in different ways.
- Educate providers on available technical assistance. Medicaid agencies could coordinate with the RECs in their State by sharing lists of providers who have a high volume of Medicaid claims or contracting with the RECs to provide technical assistance to nonprimary care Medicaid-eligible professionals. In addition, there are many existing technical assistance tools available, including those from the Agency for Healthcare Research and Quality (AHRQ), the Health Resources and Services Administration (HRSA), and the Office of the National Coordinator for Health IT (ONC). Creating a list of resources would reduce the burden on Medicaid agencies to provide direct technical assistance and increase the number of resources known to Medicaid providers.
- Advocate for State HIE services, such as creating interfaces with laboratories and radiology facilities to reduce the burden on providers
- Promote identification of business process improvements to help increase reimbursements as well as cost containment strategies to help reduce ongoing costs.

**Recommendation 2: Provide more targeted, coordinated technical assistance tools, methods and processes for Stage 1 MU for Medicaid providers. Medicaid agencies, RECs, and vendors should—**

- Provide education on the EHR certification process, and provide guidance and assistance in EHR selection and acquisition.

- Educate providers on how to use specific EHR functionalities to achieve MU objectives. Other entities can address fundamental aspects of changing provider workflow and implementing an EHR, even before addressing optimal practices to achieve specific MU objectives.

**Recommendation 3: Promote planning for the Stage 2 Meaningful Use requirements. Federal agencies and State Medicaid agencies should—**

- Implement clinical decision support rules.
- Incorporate lab results as structured data.
- Establish online access for patients to view health information and encouraging its use.
- Provide clinical summaries.

**Recommendation 4: Create a short- and long-term research agenda that addresses many of the sociocultural, technical and training/technical assistance needs of Medicaid providers, and other providers, that have been identified in this study. They should—**

- Provide information about factors that affect the perceived affordability of EHRs, for different providers and practice types.
- Show how to help providers select EHRs that fit their practice needs and workflow.
- Show how technical assistance can be improved and tailored to different practice settings.
- Provide information about how to streamline clinical documentation practices in EHRs, for providers at all levels of computer skills.
- Discuss factors that make templates successful in optimizing clinical documentation in a manner that makes sense to both the clinician entering information and the clinicians who receive information.
- Discuss implications of EHR workarounds on patient safety.
- Include lessons learned from providers who achieved MU Stage 1, and how those lessons can be applied to assisting providers meet Stage 2 MU goals.

# Chapter 1. Background and Purpose

## Purpose of the Study

The purpose of this study is to provide the Agency for Healthcare Research and Quality (AHRQ) with a better understanding of the barriers that Medicaid health care providers may be experiencing in their efforts to meet the requirements to receive incentive payments under the Medicaid electronic health record (EHR) Incentive Program. Health care providers who serve Medicaid beneficiaries are serving many of AHRQ's priority populations: inner city; rural; low income; minority; women; children; elderly; and those with special health care needs.

The specific objectives of this study are to—

1. Identify potential barriers to meeting the eligibility criteria for receiving incentive payments under the Medicaid EHR Incentive Program; barriers to adoption, implementation, or upgrading of EHR systems; and barriers to achieving Meaningful Use (MU).
2. Develop recommendations to Medicaid agencies for ways that they can help providers overcome these potential barriers as well as provide recommendations for technical assistance to aid Medicaid agencies in assisting providers. Other entities that work with Medicaid providers, such as Health Center Associations, Regional Extension Centers (RECs), hospitals systems, and vendors may also be interested in these findings.

## Background Information

The Medicare and Medicaid EHR Incentive Programs were created by the American Recovery and Reinvestment Act (ARRA) in February 2009 to provide a financial incentive for the MU of certified EHRs to achieve a number of health and efficiency objectives. ARRA specified three main components of MU: using certified EHRs in meaningful ways such as (1) to use electronic prescribing; (2) to share clinical information electronically to improve care coordination and quality; and (3) to submit clinical quality and other measures. The primary difference (although there are others) between the Medicare and Medicaid EHR Incentive Programs is that the Federal Government administers the Medicare EHR Incentive Program and States voluntarily administer Medicaid EHR Incentive Programs. This study aims to understand the barriers that Medicaid providers report to achieving MU to qualify for the financial incentives provided for in Division B, Title IV, Subtitle B, Section 4201 of the ARRA.

In July 2010, the U.S. Department of Health and Human Services' Centers for Medicare & Medicaid Services (CMS) released its final rule regarding the Medicare and Medicaid EHR Incentive Programs (45 CFR Part 170, July 13, 2010). The rule specifies the criteria that any provider (eligible professional or EP) must meet to qualify for incentive payments under the program. The criteria for meeting Stage 1 of MU include using certified EHR technology. The rule also provides specific standards for the type and quantity of data that must be collected through an EP's EHR to meet specific MU objectives. These include 15 "core" objectives, which all Meaningful Users must achieve, and 10 "menu" objectives, of which Meaningful Users must select 5 (see Appendix A).

In addition, the rule defines the eligibility criteria for the Medicaid EHR Incentive Program specifically. Under the Medicaid EHR Incentive Program, EPs include physicians, dentists,

certified nurse-midwives, nurse practitioners, and physician assistants who are the lead clinicians in the Federally Qualified Health Centers (FQHCs) or Rural Health Clinics (RHCs) in which they work. To be eligible for the program, EPs must meet minimum Medicaid patient volumes or, for professionals working in FQHCs or RHCs, minimum volumes of “needy individuals.” The patient volumes are calculated as a percentage of patient encounters. The program is staged over 5 years with Stage 1 implemented in 2011 and 2012 to provide the baseline for electronic data collection and information sharing that will be expanded through Stages 2 and 3, to be implemented in 2013 and 2015, respectively.

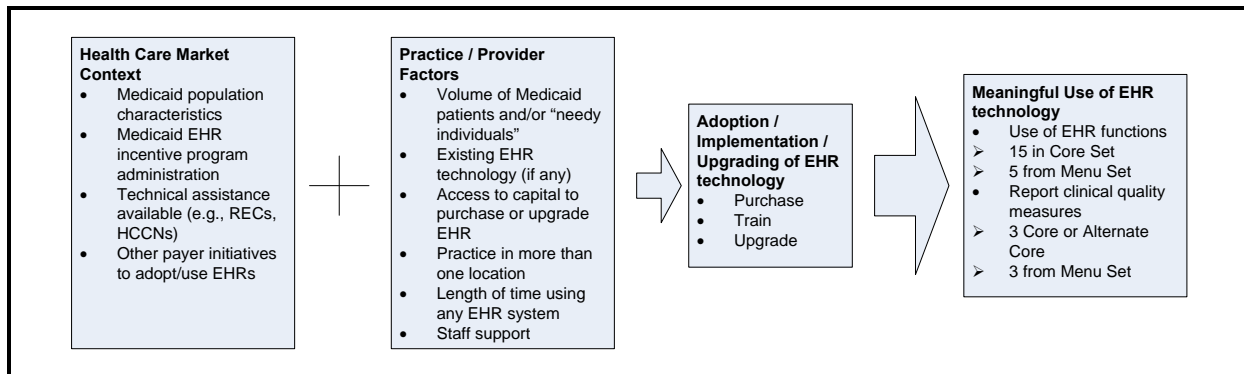
The Medicaid EHR Incentive Program (unlike the Medicare program) allows EPs to choose to qualify for the first year’s incentive payments by “adopting, implementing, or upgrading” an EHR. To continue receiving incentive payments, however, EPs must then demonstrate MU of EHRs. Regardless of when EPs achieve their first year of meeting MU (between 2011 and 2017), they can achieve Stage 1 MU objectives for 2 years, then Stage 2 MU objectives for 2 years, and then Stage 3 MU objectives for 2 years—or if they begin in 2017, for 1 year in 2021, after which the program ends.

In March 2012, the CMS published a Notice of Proposed Rule Making (NPRM) in the *Federal Register* entitled “Medicare and Medicaid Programs; Electronic Health Record Incentive Program—Stage 2.” This proposed rule describes the proposed Stage 2 MU objectives and revises certain Stage 1 MU objectives (see Appendix B). Public comment on this proposed rule is being solicited through May 7, 2012; a final rule is expected to be published in summer 2012.

## Research Questions

The research questions for this study were derived from a conceptual model that considers the health care market context and practice or provider factors that may influence providers who serve significant proportions of Medicaid-insured beneficiaries, as potential factors that could influence EHR adoption, implementation, upgrade, or MU of EHRs (see Figure 1.) Research questions generally focus on the following potential barriers to demonstrating MU of EHRs: barriers to participation in the Medicaid EHR Incentive Program; barriers to adopting, implementing, or upgrading EHRs; and barriers to achieving MU. Understanding these barriers will be necessary to ensure that minorities and other underserved communities do not face disparities in health care delivery due to lack of health information technology (IT) resources.<sup>1</sup>

**Figure 1. Factors in Medicaid providers’ ability to demonstrate Meaningful Use of EHRs**



EHR = electronic health record; HCCN = Health Center Controlled Network; REC = Regional Extension Center.

As demonstrated in the conceptual model, one premise of this study is that it is important to take into account the characteristics of the Medicaid-insured population that may also present unique issues for providers who wish to transform their health care delivery through MU of EHRs. For example, providers seeking to demonstrate how they use EHRs for patient/family engagement may face familiar barriers, such as lower health literacy rates within their patient population and the ongoing challenge to provide culturally and linguistically appropriate services. Similarly, the research questions consider the variability in Medicaid programs, health IT initiatives, and existing quality improvement initiatives in each State has implications for provider readiness to plan for MU and incentive payments. Exploring these differences may help to identify facilitators to achieving MU. Providers in a range of State and community contexts will likely have insights related to why they perceive barriers to MU differently, such as the Medicaid agency's approach to communication, provider education, and outreach regarding how the Incentive Program will be administered.

The specific research questions for this study are listed below:

*Barriers to participation in the Medicaid EHR Incentive Program:*

1. What barriers do Medicaid providers anticipate in applying for the EHR Incentive Program in their States? (For example, are there difficulties in determining whether they serve a sufficient proportion of Medicaid beneficiaries to be eligible?)
2. Has the Incentive Program affected providers' decisions about adopting, implementing, upgrading or using EHRs, and if so, how?

*Barriers to adoption, implementation, or upgrading of EHRs:*

1. What barriers do Medicaid providers anticipate in selecting or upgrading to an EHR that is certified?
2. What influence does the ability to exchange clinical information with other health care providers have on their motivation to adopt and use EHRs?
3. Has participation with a local Regional Extension Center (REC) or Health Center Controlled Network (HCCN) mitigated any of the challenges EPs face in adopting, implementing, upgrading or using an EHR?
4. What difficulties are anticipated in transitioning from a noncertified EHR system to a certified system?

*Barriers to achieving MU:*

1. Do challenges in meeting the MU objectives vary by practitioner type?
2. Are providers experiencing any difficulty in understanding the objectives that creates a barrier to meeting MU?
3. What specific EHR functions pose challenges to providers? In what way?
4. What barriers to creating structured data in EHRs exist?
5. What, if any, barriers are unique to Medicaid providers?

## **Prior Research**

This study takes place in the context of other recent research on the extent to which Medicaid providers use EHRs, whether Medicaid providers are influenced by Federal incentive payment programs to adopt EHRs, and the issues of EHR adoption, implementation, and use faced by the general provider population. The following sections outline a brief summary of other findings in each of these areas.

## **Use of EHRs Among Providers Serving Medicaid Beneficiaries**

This study does not address the overall prevalence of EHR use among providers who serve high proportions of Medicaid-insured patients, so the best source of this background information is from prior studies. The most recent national survey data on EHR adoption and use do not break out providers by payer type, so we do not know what percentage of providers who have a significant population of Medicaid patients use an EHR. However, preliminary data from the 2011 EHR Supplement of the National Ambulatory Medical Care Survey (NAMCS) showed that 57 percent of office-based physicians reported that they had used an electronic medical record (EMR) or EHR system, with 34 percent of physicians reporting that the EHR they used met criteria for a “basic” system.<sup>2</sup> This represents the highest percentage of physicians reporting EHR use since the survey began including questions about EHRs in 2001.

Because the research questions for this study focus on barriers to EHR adoption and use that are specific to providers who serve mostly Medicaid beneficiaries, including pediatricians, dentists, and nurse practitioners that are only eligible for the Medicaid EHR Incentive Program, we sought other studies indicating barriers specific to these providers. In fact, there are mixed findings of a “digital divide” among providers who serve large proportions of Medicaid-insured patients. A 2008 report published by the Robert Wood Johnson Foundation found that among physicians who served a significant proportion of patients covered by Medicaid (25 percent or higher), no difference in EHR adoption was found as compared to physicians serving a population of fewer than 25 percent Medicaid-insured patients. Additionally, the report noted that although an analysis of 2005 NAMCS data found significant differences in EHR adoption based on a percentage of revenue, this association was not present in 2006 data from NAMCS. Thus, this report concluded that there was little evidence demonstrating that providers who serve higher proportions of poor, minority, or other underserved patient populations are less likely to provide care enhanced by health IT.<sup>3</sup>

However, other studies that have examined providers with a higher concentration of Medicaid providers came to a different conclusion. One 2005 study of physicians in Florida focused on physicians whose practices are composed of 75 percent or more Medicaid-insured patients (i.e., practices with revenue that is much more dependent on Medicaid than the study cited above), and found that these physician practices were significantly less likely to report having adopted an EHR system compared with those physicians who served a lower proportion of Medicaid-insured patients.

Furthermore, a re-analysis of 2005 and 2006 NAMCS data found that physicians with greater than 50 percent Medicaid-insured patients were less likely to adopt EHRs with comprehensive functionalities (i.e., such as those required to meet MU).<sup>4</sup>

Many of the individual providers eligible for Medicaid EHR incentives practice in federally funded community health centers (CHCs), but specific patterns and challenges to EHR use within CHCs, private pediatric and dental practices, children’s hospitals, and other Medicaid provider groups are understudied. For example, the first national survey of EHR use in CHCs found that 26 percent reported some EHR capacity and 13 percent had an EHR with a minimum set of functionalities.<sup>5</sup> However, most studies of how specific EHR functions are used have been conducted outside of CHCs<sup>6-9</sup> and have focused on physicians only, not other providers, such as certified nurse midwives, physician assistants, nurse practitioners, or dentists. Furthermore, although CHCs may have some features that ease their transition to EHRs, such as internal IT support<sup>10</sup> or participation in an HCCN,<sup>11</sup> more research is needed to understand emerging

barriers to MU for both CHCs and independent providers who serve a high proportion of Medicaid beneficiaries.

## **Influence of the Medicaid EHR Incentive Program**

The first set of research questions for this study focuses on barriers to participation in the Medicaid EHR Incentive Program, examining whether providers have difficulty determining their eligibility for the program or whether the program influences adoption and MU of EHRs. Among all types of physicians, prior research indicates that interest in the EHR Incentive Programs is high. According to a 2011 research brief based on NAMCS data, approximately 41 percent of office-based physicians plan to apply for either the Medicare or Medicaid EHR Incentive Program in 2010, and 52 percent reported that they intend to apply in 2011. Of the physicians who reported their intent to apply for an Incentive Program in 2010, just over 40 percent had an EHR that could technically meet eight (out of 15) Stage 1 core MU objectives. The findings of the survey suggest that the overall readiness of physicians to meet the MU objectives varied greatly across the States.<sup>2</sup>

Only one study to date comments on Medicaid providers' interest in the Medicaid EHR Incentive Program. In a statewide survey of physicians who billed Florida Medicaid at least once through May 2010, Menachemi and colleagues reported that two-thirds of the physicians expressed interest in applying to either the Medicare or Medicaid EHR Incentive Program. About 30 percent of those physicians planned to seek funding through the Medicaid EHR Incentive Program. Physicians who saw higher volumes of Medicaid-insured patients were more likely to indicate their intent to apply for the EHR incentive program than those with low Medicaid volumes. Relative to family physicians, pediatricians were more likely to say they would apply for incentive payments, while obstetrician/gynecologists were less likely to say they would apply. Among the reasons cited for declining to apply for either program were concerns about the cost involved in achieving MU. Among Medicaid providers who served a high volume of Medicaid-insured patients, the primary concern was the cost of EHR hardware and software.<sup>12</sup>

To participate in the EHR Incentive Program, EPs must go online and register for the program by entering personal and business information used to verify eligibility and manage participation in the program from attestation to payment. The EPs cannot register until their State launches their Incentive Program. As of March 1, 2012, 43 States had launched programs and according to data from CMS, 66,663 EPs had registered for the Medicaid EHR Incentive Program between January 2011 and February 2012. The number of registered EPs by license type is shown in Table 1.

**Table 1. Number and type of providers registered for the Medicaid EHR Incentive Program through February 2012**

License Type	Number Registered
Physician	47,968
Nurse Practitioner	12,082
Dentist	4,004
Certified Nurse Midwife	1,422
Physician Assistant	1,087
Total	66,663

EHR = electronic health record.

Source: Centers for Medicare & Medicaid Services, *Data and Reports*. Available at [https://www.cms.gov/EHRIncentivePrograms/56\\_DataAndReports.asp#TopOfPage](https://www.cms.gov/EHRIncentivePrograms/56_DataAndReports.asp#TopOfPage). Accessed May 21, 2012.

## General Issues Related to EHR Adoption, Implementation, and Use

The second set of research questions focuses on barriers to adoption, implementation, or upgrading of EHRs in general, as well as whether Medicaid providers face specific challenges in health information exchange, and whether specific sources of technical assistance can help them address any barriers. With regard to prior research on these questions, the challenges to adopting and using an EHR are well known. For example, the cost of EHRs is consistently reported as the most frequent barrier to adoption. With regard to EHR implementation, studies have demonstrated that providers have difficulties in workflow redesign and with the changes in patient-provider interactions, and need technical assistance. Although a full review of issues related to how providers use EHRs is outside the scope of this report, the following selected topics from the literature raise key themes that could be common among Medicaid providers.

**Barriers to EHR adoption.** A systematic literature review of articles published between 1998 and 2009 on physicians' perceived barriers to adopting EHRs identified eight main categories of barriers: financial, technical, time, psychological, social, legal, organizational, and change process. In the 22 articles that met the inclusion criteria for the study, issues related to start-up and ongoing costs of EHR adoption were the most frequently cited. Technical issues such as the lack of training and support, limitations of EHRs, lack of customizability, and limited data exchange between EHRs were also frequently reported. Other conclusions from this review of the literature suggest that concerns about time required to learn the system, enter data, and use the EHR during a patient encounter also pose barriers.<sup>13</sup>

**Impact of EHRs on workflow.** It is well-known that the implementation of EHRs requires a change in workflow in a provider office. The process of using EHRs effectively requires a different set of actions than using paper records, and redesigning workflow is recommended as the first step towards successful EHR implementation. For example, taking notes during a patient visit is one step in workflow that changes when converting from a paper system to an EHR. Providers may take notes directly in the EHR using a custom template, free text or some combination. Many providers find the shift to electronic documentation to be a challenge and they devise an added step such as taking brief notes on paper and entering them into the system later. A survey of clinicians, from 21 primary care clinics who all use the same EHR, reported that 30 percent of clinicians usually or always wrote on a "mini face sheet" to record patient



problems, medications, and allergies, and 30 percent wrote these items on a blank piece of paper. Overall, 46 percent of clinicians reported writing on paper at least sometimes during a patient visit.<sup>14</sup>

**Provider-patient interaction.** In 2009, Shachak and Reis analyzed 14 papers published between 1997 and 2007 and summarized their findings on the impact of EHRs on provider-patient interactions during office visits in a narrative literature review. They concluded that patients are generally satisfied with their physician's use of an EHR, as well as other aspects like the use of EHR in patient education, but also identified concerns. These concerns included a "loss of rapport" with patients, and negative effects on physicians' emotional response to patients. The study noted that physicians with better computer skills led to more positive outcomes in provider-patient communication, and that the location of the computer affected patients' experience of the office visit.<sup>15</sup>

**Benefits of technical assistance.** An online survey of 2,384 physicians, physician assistants, and nurse practitioners who use EHRs found a significant correlation between the length of initial EHR training and overall user satisfaction, with the highest satisfaction found after 3 to 5 days of initial training and after 2 weeks of training.<sup>16</sup> However, about half of the participants indicated that they received little (49.3 percent) to no (4.28 percent) EHR training. This was most frequently reported by clinicians in practices of 11 or more clinicians. In addition, clinicians in the survey reported greater ease of use for basic EHR functions (represented by maintaining active medication allergy list, active medication list, and checking for drug interactions) and improved usability of "advanced" EHR functions (represented by conducting medication reconciliation and checking drug formularies) with additional training. A minimum of 1 week of training is necessary to report greater ease of use with advanced EHR functions.<sup>16</sup>

## **Use of Specific EHR Functions Related to Meaningful Use**

The third set of research questions ask whether there are specific barriers to reach MU for Medicaid providers. Some research has been conducted on the challenges to using EHRs to perform the functions necessary to meet MU objectives, but this research has not focused specifically on Medicaid providers. The sections below highlight a few key findings relevant to overall barriers to using specific EHR functions that may also be the case among Medicaid providers.

**Patient engagement functions.** EHR functions intended to enhance patient engagement with their health care include providing patients with an electronic copy of their health information upon request (Stage 1) and providing patients with online access to their health information, through a patient portal or personal health record (PHR) associated with a provider's EHR (proposed Stage 2).

A study by Ancker and colleagues published in 2011 examined the differences in adoption and use of PHRs among patients who receive their care at FQHCs in the greater New York City area by the patient's insurance type. Overall, their patient population consists of 22 percent Medicaid-insured patients. Looking across patients with all insurance types, 16 percent received a portal access code, and of these 60 percent activated their code and 49 percent used the PHR more than once. Medicaid patients were twice as likely as uninsured patients to request and receive an access code, an indication of using the service, but there were no findings to support whether this indicated more or less interest than the commercially insured population served by FQHCs.<sup>17</sup>

An earlier study by Lobach and colleagues, published in 2006, focused specifically on Medicaid beneficiaries in North Carolina and their interest in viewing their health information through a patient portal. Only 3 percent of survey participants said they would never use such a patient portal, while about 50 percent said that they would use it two to three times a year, with the greatest interest in viewing office visit summaries, immunization records, and a summary of prescriptions, and communicating with providers via email.<sup>18</sup>

**Management of patient information.** Chenghui (2011) compared two major surveys of physician use of EHRs in 2008, NAMCS and the Health Tracking Physician Survey (HTPS) to gauge the rates of use of different EHR functions. Among providers who reported using an EHR for all of their patients, over 95 percent reported using their EHR for managing patient information such as patient demographics. Although the HTPS reported similar rates of using the EHR for accessing patient notes, medication lists, *or* problem lists, NAMCS found that use of problem lists was much less frequent (nearly 70 percent reporting use).<sup>19</sup>

**Clinical decision support.** The HTPS found that over 88 percent of EHR users enabled clinical decision support such as checking potential drug interactions, while the comparable percentage reported in NAMCS was over 64 percent. Over 90 percent of clinicians responding to the HTPS reported that they obtained information about treatment alternatives or recommended guidelines from their EHR, while less than 65 percent of physicians responding to NAMCS reported using their EHR for reminders regarding guidelines-based interventions or screening tests.<sup>19</sup>

## **Chapter 2. Methods**

### **Study Design**

This study used a qualitative study design to collect information from health care providers eligible for the Medicaid EHR Incentive Program drawing on eligible provider types across a range of practice settings in both urban and rural communities. Both in-person and virtual focus groups were identified as a feasible, cost-efficient strategy to provide the most useful information to AHRQ, CMS, and other stakeholders within the necessary timeframe. Focus groups allow the moderator to probe for information across participants with similar experiences. A written survey was unlikely to provide the level of detail or context necessary to convey precisely the root causes of some barriers to Meaningful Use (MU) that could be uncovered in a focus group setting.

Health care providers eligible for the Medicaid EHR Incentive Program include physicians, dentists, nurse practitioners, certified nurse midwives, and physician assistants practicing in a Federally Qualified Health Center (FQHC) or Rural Health Center (RHC) led by a physician assistant. Since pediatricians must meet a lower Medicaid patient volume than other physicians, they were considered separately from physicians who treat adults. Our sample included providers from all six of these categories, both those who had adopted EHRs, those who had not yet adopted EHRs but were planning to, and those who had no plans to adopt EHRs.

To refine the study design and focus group composition, we solicited input from our Technical Expert Panel (TEP) in November 2010 and March 2011 prior to and following the pilot test of the study instruments. The TEP is composed of Federal Government officials involved in the MU regulations, their deployment, and future rulemaking and technical assistance efforts. The TEP also includes experts in data collection and analysis methodologies.

We developed two documents to guide our data collection efforts: a participant screening document (Appendix C) and a focus group moderator's guide (Appendixes D, E, and F). The screening instrument is used to identify eligible focus group participants. It collects information about providers' Medicaid patient volume and adoption and use of EHRs. The moderator's guide is used to gather analytic data. It provides a structured discussion guide for use in the focus group and applicable background information for eliciting information from focus group participants.

The main data collection instrument, the focus group moderator's guide, is based on the conceptual model for the study described in Chapter 1, following hypothesized relationship between factors that might affect Medicaid providers' ability to demonstrate MU of EHRs. The moderator's guide used by focus group facilitators asked participants about specific barriers and facilitators to adopting and using EHRs, rather than speak to their experience of using EHRs on the whole. Thus, the results are not an evaluation of general EHR use among Medicaid providers, but rather a guide to inform current and future policy directed at promoting MU of EHRs among Medicaid providers.

### **Pilot Testing**

In February 2011, we pilot tested the screening instrument and the moderator's guide with nine Medicaid EPs from West Virginia, Pennsylvania, and Delaware. Seven of these participants had experience using EHRs and two did not. These participants included a mix of private

practice and CHC staff. As a result of the pilot test we revised the screening instrument to ensure that sufficient information about providers' EHR use was collected to confirm them as a true "adopter" or user of EHRs, for the purposes of this study. We also confirmed that the focus group configuration and moderator's guide should address providers who are currently using EHRs and providers who are not currently using EHRs separately.

## **IRB and OMB Approvals**

Since this study included federally funded data collection efforts, it was subject to the Paperwork Reduction Act, and required approval from the Office of Management and Budget (OMB). The information collection request package was submitted to AHRQ on October 25, 2010. Following discussions with AHRQ officials, the revised package was submitted on December 2, 2010, and a request for comment was published in the *Federal Register* on January 18, 2011. Only one comment was received on the proposed data collection effort, a joint response from the American Dental Association, the Association of State and Territorial Dental Directors, the Children's Dental Health Project, the Medicaid/SCHIP Dental Association, and the National Network for Oral Health Access, stressing the need for the inclusion of dentists in the focus groups. At the conclusion of the comment period, final changes to the study design resulted in the addition of two additional focus groups with individuals who had not adopted EHRs. The final data collection procedure was approved by OMB on October 12, 2011, Number 0935-0186. RTI received approval from its internal Institutional Review Board (IRB) on November 8, 2011, Reference Number 12742.

## **Confidentiality of Data**

Individuals and organizations were assured of the confidentiality of their replies under Section 934(c) of the Public Health Service Act, 42 USC 299c-3(c). They were informed of the purpose of the data collection and that, in accordance with this statute, any identifiable information about them would not be used or disclosed for any other purpose. In this study, information that can directly identify participants, including name, business address, email address and telephone number, was collected for the purposes of mailing instruction packets and gifts to recruited focus group participants. All materials, including the consent form and verbal consent script, were reviewed and approved by the RTI IRB prior to contacting any potential participants.

The project team also imposed several security measures to ensure protection of confidential information collected from project participants. All computers used by project staff have Pointsec encryption software installed, are password protected, and access to shared drives is limited to staff who have signed data confidentiality agreements. Information collected in paper form was stored in a locked file cabinet and only those staff who worked with the data were provided access to the file cabinet. Paper-based data were entered into an electronic database, stored in a password- and write-protected location on the local and/or shared drives; the paper files were shredded. Audio and video recordings were stored in electronic formats with the protections described above. CDs and DVDs with audio and video recordings were stored in locked filing cabinets until an electronic copy was made, at which points the CDs and DVDs were also shredded.

During the focus groups, all participants were asked to use first names only. In the event that a participant used his/her full name or that of another participant, the transcripts were edited to show the first name only. If participants provided individually identifiable information (e.g., the name of a practice location or a colleague's full name), that information was redacted in the transcripts.

## **Recruitment**

For the main study, focus group participants were recruited from 10 States and from a mix of urban and rural areas. These States were targeted for recruitment in this study due to their relatively high proportions of Medicaid beneficiaries (as compared to the total State population) and mix of Medicaid managed care and fee-for-service.

All Medicaid providers were screened using the approved participant-screening instrument. Those that met the threshold for Medicaid patient volume (and "needy individual" volume in CHCs and RHCs) that would indicate they could qualify for the Medicaid EHR Incentive Program were invited to participate.

We solicited lists of potentially eligible providers in four States (New York, California, Tennessee, and Louisiana) based on Medicaid claims volume. In addition, notices were placed in several State-level professional association newsletters, which resulted in a number of inbound calls from interested individuals. Notifications about the study that were disseminated to Medicaid providers by RECs and other contacts at Medicaid agencies in Arizona, Delaware, Michigan, Pennsylvania, Vermont, and Washington also yielded a number of inbound calls. Individuals from all States except Michigan participated. We contracted with a focus group organization to contact providers and screen them for eligibility. Individuals eligible for the study were assigned to an in-person or virtual focus group depending on their availability and whether or not they had adopted an EHR.

## **Data Collection**

Groups were conducted both in person and virtually using Web-based teleconferencing application. All participants were provided with a copy of the consent form prior to the start of the session. The form was reviewed with the group and each participant received a duplicate signed copy of the form at the end of the session. Participants received a \$200 gift for their participation.

Each session was led by a team of two moderators, with one serving as the lead and the second providing support. Moderators were familiar with the Medicaid EHR Incentive Program and experienced in focus group facilitation. A notetaker was present at each session and recorded both content and structured data (e.g., the EHR functions each participant was using). All sessions were audio recorded and in-person sessions were also video recorded. All audio recordings were transcribed and reviewed by project staff for accuracy.

## **Analysis**

A coding structure was developed for the systematic review of transcripts. A two-member team reviewed the transcripts and coded the information from the files. The initial coding structure was developed based on the results of the pilot test and the research questions. New

codes were added during the coding process as necessary to capture the breadth of information provided by participants. All transcripts were coded in NVivo<sup>®</sup>, Version 9.2. Attributes regarding each participant (e.g., type of practitioner, urban or rural practice location) were compiled from the screening documents and transcripts and uploaded to the NVivo file.

For each focus group, the code sets from each team member were compared for consistency. In the event that the two coders differed in their interpretation of the information, the item was reviewed to determine if it was a clerical error or a more substantive disagreement requiring review by the full research team. Focus group data were organized by theme and used as the basis to develop the analysis presented in this report.

## Chapter 3. Findings

The findings presented in this section include both the synthesis of data from focus groups as well as specific observations and direct quotations from focus group participants. Direct quotations are set apart in text boxes.

### Composition of Focus Groups

#### Characteristics of Focus Group Participants

A total of 68 individuals participated in the focus groups (Table 2). To better understand what issues might impact adoption and usage of EHRs, we categorized participants across geographic location, type of provider, and their status with regards to EHR adoption (adopted, not adopted but planned to, not adopted with no plans to adopt). Since eligibility for the Medicaid EHR Incentive Program varies slightly for pediatricians, we separated them from other practitioners who see adults only.

The majority of participants (69 percent) were physicians, while 22 percent were nurse practitioners, certified nurse midwives, and physician assistants, and 9 percent were dentists. Nearly all (93 percent) participants practiced in small practices with fewer than 10 physicians. Only four participants were employees of FQHCs or RHCs. The majority of participants either used EHRs or planned to adopt EHRs; a small minority (10 percent) responded that they have no plans to adopt an EHR.

**Table 2. Participants by license type, practice size, and EHR adoption status**

Participant Characteristic	Number	Percentage <sup>a</sup>
License Type		
Pediatrician	26	38%
Physician, Adult Medicine	21	31%
Nurse Practitioner	10	15%
Dentist	6	9%
Physician Assistant	4	6%
Certified Nurse Midwife	1	1%
Practice Size		
Solo	32	47%
2 to 3	20	29%
4 to 9	13	19%
10 or more	3	4%
EHR Adoption Status		
Adopter	50	74%
Nonadopter, Plans to Adopt	11	16%
Nonadopter, No Plans to Adopt	7	10%

<sup>a</sup> Percentages may not add to 100% due to rounding.  
EHR = electronic health record.

## Geographic Diversity

Providers from nine States participated in the focus groups. The most frequently represented States were Arizona, Louisiana, and New York. A significant majority (81 percent) of providers were from urban areas. The geographic diversity of the focus group participants is presented in Table 3.

**Table 3. Participants by State and location**

Geographic Characteristic	Number	Percentage
State (n=68)		
Arizona	18	26%
California	6	9%
Delaware	1	1%
Louisiana	17	25%
New York	17	25%
Pennsylvania	3	4%
Tennessee	4	6%
Vermont	1	1%
Washington	1	1%
Location (n=68)		
Urban	55	81%
Rural	13	19%

## Range of EHR Systems

Focus group participants who had adopted an EHR (n=50) used a total of 17 different EHR systems. The most commonly used system was eClinicalWorks (n=17). The large number of eClinicalWorks users is partly because participants were recruited from New York City. The New York City Department of Health and Mental Hygiene's Primary Care Information Project (PCIP) assisted providers who work in underserved communities to adopt and implement EHRs, specifically eClinicalWorks. In addition to eClinicalWorks, only four other systems were used by more than one respondent (Intergy, NextGen, Amazing Charts, and e-MDs). The EHR participants used are summarized in Table 4.



**Table 4. EHR vendors**

<b>Vendor</b>	<b>Number (n=50)</b>
eClinicalWorks	17
Intergy	5
NextGen	4
Amazing Charts	2
e-MDs	2
AllScripts	1
Athena Health Net	1
Centricity	1
docAssist	1
EHS	1
MED3000	1
MEDENT	1
MedTron	1
Office Ally	1
Practice Fusion	1
Prognosis	1
Sevocity	1
Unknown	8

EHR = electronic health record.

## **Medicaid EHR Incentive Program: Understanding, Influence, and Participation**

### **Sources of Information on the Medicaid EHR Incentive Program**

Participants reported having received information from a wide range of sources regarding the Medicaid EHR Incentive Program. Among the sources of information cited were: colleagues and employers, government agencies (either the State Medicaid agency or CMS), RECs, general online searches, EHR vendors, journals, local hospitals, medical societies, and insurers. Individuals who had worked with the REC in their State often had a more detailed understanding of the incentive program than those who had not worked with an REC. A few participants felt strongly that information should only be coming directly from CMS since CMS administers the incentive program.

Knowledge of the program came from both formal and informal interactions; some contacts were initiated by the participants while others were initiated by the source of the information. For example, a number of participants had searched for information online or participated in a Webinar hosted by a government agency, vendor, or insurance company. Others had received direct information from the management of their practice or multispecialty group at a staff meeting. A number of participants also cited more general sources such as “the media” or “colleagues” or prefaced statements with phrases like, “I’ve heard...” Most participants used more than one source of information.

[I am] mainly getting most of the information about it through medical journals, medical conferences, and also my [EHR vendor] has been sending us information, bulletins, as well as what they tell us, so they've been very, very useful.

Several hospitals in the area and the local medical society had lectures in regard to MU.

I went to a lecture at one of the hospitals and the State has a team to go out and try to facilitate doctors switching to the electronic medical records.

Despite the number of sources of information available to participants, they indicated that they would like clarification or more information in a number of areas. Participants also demonstrated that some misunderstanding about the Medicaid EHR Incentive Program: the most common misunderstanding was whether Medicaid would institute penalties for providers who failed to adopt EHRs or reach MU. Some providers seem to be confusing the source of payment penalties, since there will be adjustments made to *Medicare* reimbursements in 2015 for providers who are not Meaningful Users of EHRs according to the Stage 1 rules for MU.

We measured [the cost] against the penalty that is coming up in 2015 of 1 percent and the following year 2 percent and the numbers clearly were going to be a much greater loss for us to get into computerized systems and we decided to forgo the whole thing.

I believe they are starting to implement starting with Medicare and then Medicaid with 1 percent in the first year and 2 percent and so on.

After a certain amount of time, Medicaid or Medicare is going to dock 1 percent of the payment if you are not on the electronic medical record.

Participants also misunderstood the requirements for eligibility for incentive payments under the Medicaid EHR Incentive Program. When asked directly, "What is your understanding of the Medicaid EHR Incentive Program?" some participants responded that there was a base amount of incentive, and then an added incentive for meeting additional objectives. Others responded that meeting a subset of clinical quality measures was sufficient to receive incentive payments. These participants may not be distinguishing between the Medicaid EHR Incentive Program and other payment programs offered by their State Medicaid agency, or alternatively, they may be misunderstanding the Medicaid EHR Incentive Program itself.

It is a dollar amount and if you meet certain criteria specifics you get an added incentive.

For those that are coming on time for well-visits, their immunizations should be up to date, you get incentive.

That for instance, you're following diabetics and their A1c's are checked every 3 months and they have referral to eye doctor and to foot doctor, you get enhanced payments, or if you're following people with HIV and you monitor their T-cells and viral load every 3 months, and at clinical endpoints, people are undetectable with their viral load, again you get enhanced payments for that.

Many participants were not fully aware of the MU objectives, and some felt that the objectives had shifted over time.

Nobody's ever given me any kind of direct information from the government as far as what the criteria are and so I would like to have more information regarding this.

In the beginning we had 8 or 10 criteria that we had to meet, but every time that I meet with someone else, they come up with a new thing that we haven't met. I usually tell them nobody told me anything about that before. ...many times they come up with a new thing that we haven't maybe done, but we didn't know.

Participants were interested in additional information to help them better understand the Medicaid EHR Incentive Program, including more information about the MU objectives and a step-by-step process required to reach MU.

There's lots of articles in journals that talk *around* the subject, but not a lot of definitive information I would like specifics in terms of what are the step-by-step processes in terms of from A to Z? What must one do from step 1 to steps 3–5? What are the specifics that one would need to do 1, 2, 3?  
Step by step, how am I supposed to do this? What declarations do I need to make? What documents do I need to sign? [I need] details about what the MU requirements are and honestly I'm not finding that anywhere.

## Determining Eligibility for the Program

When asked how they determined the percentage of Medicaid patients in their practice, most participants replied that they used the practice's billing or practice management systems. A number of participants reported that their management staff tracked that information for them. Other participants estimated or guessed at the total number based on their knowledge of their patient population, while a few manually counted the total. Participants did not report challenges in using their billing or practice management systems to develop a patient census. "I can run a report," was a common statement.

Although determining the percentage of Medicaid patients was generally not reported to be difficult, a few participants noted challenges in determining which patients could be counted toward their total Medicaid population. Participants questioned whether individuals enrolled in children's health insurance program (CHIP) or a Medicaid health management organization, or who were dual eligibles (those who qualify for Medicare and Medicaid), could be counted towards their total. The current economic environment has resulted in fluctuations in Medicaid status for several participants' patient populations. As a result of the economic downturn, they have increased numbers of Medicaid patients. At the same time, more patients are switching between insurance programs and/or periods of uninsurance, which can make counting the number of Medicaid patients challenging.

Before we started at 30 percent; it's probably half and half now.  
I guess in the beginning, it was about half and half but...the percentage is probably more weighted, like 60/40.  
And people fall in and out of Medicaid as well, you know. With all the unemployment we have right now, there are people who are on Medicaid that you would never expect would be on Medicaid. But [they are] on Medicaid by virtue of being on unemployment.

There were also some issues with specific categories of providers being eligible for the Medicaid EHR Incentive Program.

I am familiar with it [the incentive program]. It's very interesting because they list midwives as being eligible for reimbursement, but I actually don't know if that includes all licensed midwives or just certified nurse midwives. So I'm not a certified nurse—in New York State everyone is just a licensed midwife...Although 30 percent of my practice is Medicaid and I think I meet enough MU for the last year or two to apply, I don't actually know if I'm going to get any reimbursement—I hope so, but I don't know if I actually will.

Changing the laws to make physician assistants eligible providers I think is essential for us as a profession. One barrier is that physician assistants are not eligible for incentive payments and I think if nurse practitioners are then physician assistants should be.

Overall, participants did not indicate any challenges associated with deciding for which State's incentive program to apply. Indeed, several participants questioned whether it was possible for a provider in one State to see a Medicaid patient from another. Only two participants mentioned seeing Medicaid patients from more than one State. In both instances, the significant majority of their Medicaid population came from the State in which the practice was located. Participants also did not report conflicts in determining whether to apply under the Medicare or Medicaid Incentive Programs, but did not elaborate on this point.

## Understanding of EHR Product Certification

Participants placed a high degree of importance on using a certified product. For those planning to apply for the incentives, certification was seen as critical. Several providers had previously used an EHR that was not certified and did not seek certification. As a result, those providers switched to a certified product to participate in the Medicaid EHR Incentive Program.

Yes, it's 100 percent absolute. I would not go with anyone that was not certified.  
I want to be able to get reimbursements so it's very important.  
If you are not certified you are not getting any money.

Although participants viewed EHR certification as very important, they expressed some misconceptions about what certification means. Several participants thought that certification implied that an EHR would remain available in the marketplace or that it is a stamp of approval about the overall quality of the EHR.

We don't want to have another system that just becomes dormant and go switch to a third EMR.  
I'm not very good at differentiating between a good and a bad EHR, and I don't want to be a victim of a bad EHR, like I've heard some horror stories. So if you have a certification I'm assuming that it's like a seal that the EHR is something that is certified as something that is feasible and workable.

A few participants noted that certification was not important to them. In those instances, they were employees of larger organizations and were not involved in the EHR selection process. In addition, their employers would be the recipients of the incentive payments, rather than the individual providers. These participants prioritized patient care over the incentive payments.

To me as an employee, it doesn't really matter. My main focus is: I want something that is going to help me give the best patient care.

## Influence of Incentives from Other Payers

In general, participants were not aware of commercial payer incentives or penalties for not adopting an EHR—both among adopters and nonadopters. In instances where participants were aware of incentives such as enhanced reimbursement rates (this occurred almost exclusively among EHR adopters, with one exception), the incentives were not a factor in participants' decisions to adopt an EHR. In a few instances, participants were aware of increased reimbursements for participating in a patient-centered medical home (PCMH) or accountable care organization (ACO). In those instances, participants noted that their organization was pursuing PCMH or ACO status and that they assumed that deciding to participate in the incentive program and the PCMH/ACO were related activities.

Yeah, our site actually got certified as [an ACO], and so I know that's sort of the utilizing the EHRs can be part of our ability to maintain that status and probably help the patients.

...part of our company's goals right now, is becoming a patient-centered home. I can't remember the exact terminology. So I'm sure that the people who picked it had that in mind.

...becoming certified as a patient-centered medical home carried with it extra reimbursement from all the insurers in the State. One of the criteria to reach the highest level of reimbursement of all those insurance companies, including Medicaid, was having an EHR so that was the one incentive that the commercial companies was putting in—that is if you became certified as a patient-centered medical home, you got some extra reimbursement from all the insurers and the highest level could only be achieved [with an] EHR.

## Extent to which Medicaid EHR Incentive Program Is/Was a Factor in Adoption (Adopters and Nonadopters)

Participants had mixed reactions to the Medicaid EHR Incentive Program and the degree to which it influenced providers' decisions to adopt and use an EHR. Some providers, including nonadopters, indicated that their decision was influenced by the Medicaid EHR Incentive Program. Other participants noted that it was a factor in their decision, but not a significant factor, and a third group indicated that it would not influence their decision to adopt an EHR or the way they would use their EHR.

Among those who were influenced by the Medicaid EHR Incentive Program, the monetary incentives were central, and improvements to quality or improved patient care were secondary.

It's a great big carrot for me. What they're proposing is quite a bit more money than it actually costs.

Yeah, the money is definitely an incentive. It's a huge chunk of change for our system and we've had lean times because we're a community clinic system. About a third of our patients have no insurance and we just do sliding scale or nothing for their care. And this has definite incentives to get the money and I think that there's some side benefits clinically—I think clinical summaries are good things. I think e-prescribing is a good thing. And there are other parts of it that are maybe helping us tidy up our systems a little better in order to meet the criteria. So it's a good thing, but the money is the main reason I think for us.

Quite honestly, for us it is the Medicaid incentive money. I think without the incentive money we would have dragged our feet for another several years and waited until better communication existed between existing systems. So, because the money is so attractive at this time and the fear that it might go away, we are going to jump on the bandwagon now.

For providers who were longer-term users of EHRs (e.g., more than 3 years), the benefits of the Incentive Program were more mixed, and encouraged some, but not all, providers to use their EHR according to the Incentive Program requirements.

I think that the incentive caused us to use the EHR according to the MU criteria because we're already using the EHR so why not, you know, why not achieve those criteria and get the added incentive? We're doing it anyway.

I was already on an EHR before the incentive program was announced, I think, so, sure, I mean it's motivating, of course, for anybody who's not already on a system, but I was already on an electronic system, so it just motivated me to just continue to push forward, to meet a lot of the other measures.

For a few providers, the incentive programs had little to no influence. For those who had already adopted an EHR, they were continuing on a path that they had already decided upon. For those who had not adopted, and did not plan to adopt, the financial incentives were not sufficient to overcome the perceived loss in productivity.

I don't think it's driven really by the incentive as much in my office....I think it's a plus, but I don't think it's driving a lot of our decisions.

Not at all. No, because we had started using the EHR when we opened the office for the first time. This is the only way that we are keeping records.

I don't think getting an EHR would allow me to stay in practice...I don't think [the incentive payment] is going to cover my expenses enough with the slowdown in my practice.

Participants' experience with Medicaid, specifically instances where Medicaid did not pay as expected or retroactively modified payment rates, may play a role in their perceptions of the Medicaid EHR Incentive Program. A few providers mentioned that they were suspicious about whether they would actually receive the incentive payments or questioned whether penalties would come into play even though they are not currently part of the program. These perceptions of the relationship between Medicaid and the providers may pose a challenge to participation in the Medicaid EHR Incentive Program

They're already starting to reimburse less for everything. For instance, for a urinalysis, a year or a year and a half ago, Medicaid paid for them and then all of a sudden they said they're not paying for it and took back money retroactively. So they're going to keep doing that and [you're] just going to have to work harder and harder and harder.

I myself was doing over 60 circumcisions every month. I heard the rumor that Medicaid was no longer going to pay for them. I called Medicaid, they said it was a lie. And guess what, it wasn't a lie, and retroactively, which is typically what Medicaid has done, retroactively they discontinued it. We had done 3 weeks of circumcisions for free, then Medicaid came back and told us we were not allowed to charge the patient. I would not trust Medicaid.

## **Adopting EHRs: Common Processes and Barriers**

### **Factors in EHR Product Selection**

Participants who belonged to larger practices did not have a lot of input into the selection of the EHR they were using. However, participants who were solo practitioners or were the lead for their practice did play a role in selecting their EHR, and most of these providers commented that the main criteria for selecting an EHR were cost, usability, and high-quality technical support.

I wanted to have something that is very intuitive, easy to use, and an EMR that is not too expensive and has excellent tech support.

...so the selection was based on usability and ability to integrate electronic pharmaceutical connections, based on the ability to actually use the system with templates as well as how easy the system is to navigate. I think that was one of the major factors. All systems have the primary functions, but the ease of use of the system was very important. Cost of the system obviously was also a factor and those are the three things: the ability to use it, the ease of using it, and the cost of the system.

First-time buyers tended to be more concerned about cost; but those transitioning from one system to another incorporated a number of lessons learned into their decision about selecting the new system.

The problem with trying to select an EHR is that no one told me what I was supposed to look for except for the companies that sell them and that is misleading. So we had a search committee—myself and a few other physicians...and we went to places that had EHR and narrowed it down to [two EHR vendors], and after speaking with some practices that were using [them] we purchased [one] system. If I knew then what I know now, I would probably pick the same system but I would be a much more savvy consumer.

I think part of what could have played into the decision is actually being able to utilize [the system] for a while. Sort of a trial period, to see what the support is like, to see what it's like in real practice, but that's just a lot to ask of a practice. The only other thing that you have is to be able to look back and say "oh, if I had known that it couldn't do this, or it couldn't do that, or it never would have that ability, maybe I would have tried something else.

## Sources of Information Regarding EHR Selection and Implementation

The majority of participants commented that they did their own research to determine the EHR they would purchase. This research included Web-based searches, talking to colleagues who used different products, or contacting different EHR vendors for demonstrations. Others identified the REC as the source for help in selecting an EHR—especially in cases where the REC had endorsed certain vendors or had arranged for a special price for certain vendors. The majority of EHR adopters said they received technical assistance from vendors, professional associations and peers, and a small number of participants mentioned RECs. Even though the RECs were not mentioned frequently, when they were referenced, the comments were always positive.

I think the recommendation of other physicians or the hospital would probably play more heavily into the decision than anything else.

The persons who are already in pediatrics who had used the system before us...their opinion carries most weight.

I actually did my own research. I went to the library and just looked stuff up and looked for features that were available. Pricing was a big issue, [as was] having a good IT support/helpdesk available.

We Googled...if you get online there's ratings and provider feedback on a lot of these systems.

Well, [the REC] helped a little bit with the decision-making process. When we narrowed it down to two or three different systems, the gentleman actually came in and sat through some of the presentations and wouldn't give us a thumbs up, thumbs down, but basically told us—that's good. We made the decision but I think he helped us at least with the narrowing process and he, as far as the paperwork involved and the different hoops you have to jump through in order to get the incentive, he guided us along, helped us. He was very responsive if we had questions. It's been really, really, helpful. I think it would have been very difficult without him.

But it wasn't until we had [the REC] step in that they basically (1) pointed out how I qualified...for the medical assistance incentive which is better paying than Medicare. I thought I was going to try to use Medicare, and they actually showed me how I could actually qualify for MU with medical assistance, which is a lot more money, number 1. Number 2—we implemented the program last year and they were helpful every step of the way where I was able to receive the payment within a couple of weeks of bringing them in the picture. They also took explained what MU is all about and made sure that I'm meeting all the criteria. Often times when I trying to communicate with my vendor about what I need to do with my system, [the REC], the person I work with would be able to communicate my problems and my frustrations a lot better to the vendor than I could, because they come to my office anytime I ask them to which is very helpful.

## Benefits of EHR Use Anticipated By Nonadopters

**Time savings and minimizing paper.** Nonadopters tended to perceive more benefits than risks for her use, and many of their expectations sharply contrasted to the experiences recounted by some EHR adopters who participated in this study. When asked about their expectations for adopting and using EHRs, some nonadopters indicated that they thought it would save time by streamlining their file management and improving their efficiency and the care of their patients. Specifically, participants noted that they expected to realize some efficiency because charting

could be done in real time rather than performing charting activities at the end of the day. In addition, some participants expected to be able to see more patients because the documentation would be simpler and require less writing.

After work a lot of my time is spent in documentation...and so I know for me it would save me time.. Probably the most positive thing would be time—saving time.  
Yes, when I'm doing my charting for the evening or after each patient, that's very time consuming.  
With the paper record let's say that Mrs. Smith wants to talk to one of the doctors on Monday so the nurse goes and pulls the chart and the doctor returns her call and makes a note on the chart and it is on his desk. So Tuesday she comes in for an appointment, so the nurse goes to the file cabinet and it is not there (because it was used the other night when the other doctor returned the call). So she has got to go and spend time finding the chart and I have to see the patient without benefit of her medical history (and what my partner told her last night on the phone)...[Not to mention] the manpower hours of filing charts and trying to find thousands of charts and if one is missing and you need some vital information on it. So electronic medical records are going to greatly expedite things and save on personnel cost and help us do our jobs better.

Some participants find some EHR functions, such as e-prescribing to be very convenient and so they expect that additional functionalities will further streamline workflow and improve efficiency. However, one participant cited the concern that the expected efficiencies may not be achieved and that EHRs would slow them down and reduce their patient load.

I was hoping that the electronic medical record would help make our life easier. Also help make our life more convenient by seeing more patients and you don't have to write and can go click, click, click and that is why I am hoping for that. Right now I like the way we are doing the prescriptions and that is very convenient, so my main concern is it is going to slow us down in seeing patients and cut our patient load down.

Other nonadopters noted that they expected the use of an EHR to help them better organize their records and facilitate transmission of information from one provider to the next. Specifically, participants commented that time would be saved by the ability to access and transmit information electronically rather than manually having to track and monitor responses to faxed requests for medical information. In addition, participants commented that they preferred to use email over fax to receive and send patient information.

Similarly, many nonadopters indicated that they expected EHRs to reduce their need to manage the volumes of paper that they now need to shuffle. The expectation is that information will be easier to locate and will be better organized. Participants liked the idea of not having to store and manage paper records and expected to see some cost savings that would offset their investment in the system.

I like the idea of not having a bunch of charts, papers, faxes. You get information from specialists through fax, and some of them send through e-mail. It's just much easier to get an e-mail and then we just transfer it to the patient's record.

I like the idea of not having papers all over the place. There's a lot of time wasted in filing and trying to find things, misplaced stuff that you can't find.

Participants also expected that EHRs would reduce the time it takes to access a patient's clinical summary. Specifically noted were the expected ease with which they could get a concise summary of a patient's record including history, allergies, medications, and past surgeries without having to search through a lot of paper.



**Improved coding.** Nonadopters also expected that using an EHR would improve coding because it was more efficient. They felt that the use of structured data and the parsing of data into separate fields would improve legibility and reduce coding error. The emphasis was largely on improving billing and revenue streams by getting the coding right the first time, and reducing the time it takes to go back and justify the coding to payers. Participants specifically commented on the ability to better capture patient demographics and the value of the ability to correctly code the level of visit for billing purposes.

They say pediatricians lots of times under-code what we do. For example, we might code a level 03 visit but if you really looked at what we have done as far as work and history, physical exam, and medical decisionmaking, it could be coded as an 04, which would mean you would get greater revenue.

**e-prescribing.** Nonadopters thought that e-prescribing would be a very useful function, particularly with the ability to check correct dosage, drug interactions, and allergies. In addition, one participant indicated she expected e-prescribing to help minimize some of the confusion that occurs at the pharmacy.

As far as e-prescriptions I am very supportive of them, and I am hoping that it will eliminate or decrease some of the discrepancies of filling medications at the pharmacy. For example, we have a problem with Loratadine [an antihistamine] being read as Losartan [a blood pressure medication] despite the fact that we put Claritin next to the Loratadine, so hopefully that will decrease some of those errors.

Most participants agreed that sending prescriptions to the pharmacy would require a little work on the front end, getting the information into the system, but that it will save a lot of time downstream when refills are needed. Participants also indicated that having a medication list and history would be very beneficial.

I think the electronic prescriptions to the pharmacy, as well as the medication lists that the patients are on are great. Half the time when I see the patients, they're not even sure what medications they're on. I think that would be helpful.

It might be a little cumbersome on the front end to put in, but I think it would make it easy to electronically transmit refills.

**Ability to share patient information electronically.** Nonadopters also commented that the ability to share information among providers was a benefit of adopting and using an EHR. Most comments referred to the ability to electronically transmit information among providers in multisite practices, but solo practitioners questioned the value to them of making the investment. In large part, however, nonadopters agreed that sharing data, especially medication and problem lists, would be beneficial.

Several participants commented if they had an EHR, the faxes that they now receive (generated by the EHR in emergency rooms or urgent care centers) could be sent electronically, and that having patient information in electronic format that is comprehensive and accessible would be a helpful benefit.

...it just doesn't make sense [to make] that investment, unless you have separate locations to share information with...if you are at one office, you have all your charts at your disposal to look at and it's just a lot of investment, not just monetary, but physically, to convert all those paper charts, patient charts into computer records...

## Concerns about EHR Adoption and Use

**Cost of EHRs and reduced productivity.** Nonadopters expressed concerns about being able to afford an EHR, citing low overhead margins and reduced reimbursement rates from Medicaid for the care they provide. This concern was especially true for solo practice providers who commented that the cost will not allow them to stay in practice. Comments also indicated that the downturn in the economy, resulting in more people receiving health care coverage through Medicaid rather than higher-paying commercial plans, is creating an environment where the cost of EHRs is prohibitive in spite of the potential additional payments they might receive through any Medicaid EHR Incentive Program. Some providers commented that they may have to work harder to make up for the investment, noting that the benefits will not accrue to the provider but rather to the State. Finally, providers noted that the transition to EHRs may require them to see fewer patients in a day, reducing their productivity to an extent that they could not afford to implement an EHR.

I think there are a couple of different factors going back to what is the purpose of the EHR and how is it superior to using an in-office written medical record? Is it cost effective and is there an incentive and are we going to save money using a system such as this? How are you going to pay for that system? And we're going to have to work harder to make up for that money. It's not going to benefit us. It's going to benefit the State, the country in terms of coming down on us for other reasons, but it's not going to benefit a very solo practitioner. It's very time consuming.

[What worries me most about the EHR is] I guess (1) learning how to use it, and (2) just that it would slow me down.

You're just going to have to work harder and harder and harder. So, you're going to be there until the waking hour trying to fill out your EHRs and make sure it's coded according to this or that.

I am in the process of looking but have not decided when to implement it. I am reviewing some systems but I have not made up my mind yet. My main concerns are decreased patient flow by spending a little more on technology and because of the reduced flow, decreased productivity.

In private practice you can't stay open if you are limited in the number of patients you can see because of the amount of input you have to put into the computer.

Some nonadopters commented that they were very early in thinking about adoption and the questions of cost. One participant noted that their billing service approached the practice to recommend an EHR but that they had not had time to really understand the costs yet.

To tell you the truth, I have not even costed them out, but my billing service has approached me and showed me an EHR and wanted to know if I am interested in using it. I have no idea at this time. If we are talking about \$20,000, \$30,000 or \$40,000, we are talking about an enormous amount of money; so where is the benefit of it?

Some nonadopters were also concerned about the systems becoming obsolete and the stability of some EHR vendors. Small practices acknowledged that they could not afford the legal fees that might be necessary to get a vendor to make good on contracts if they go out of business or if they are purchased by another vendor. Some nonadopters indicated that they would be more comfortable waiting to see where other providers in the area are investing before making a commitment.; others just expressed general concern about the market.

I think it is going to put the physicians that went along with a particular EMR in a very difficult position to negotiate anything. The amount it would cost you in legal fees to iron out all of these [issues] is not worth the trouble for individuals or small groups and is way outside our league.

As far as the cost, my concern is purchasing a system which is out of my budget due to the [low] reimbursement and then it becomes obsolete in x amount of years. So I am waiting to see if there is a system [that] at least providers within my area are able to log in and use.

Also, if we choose certain software vendors, how long will they be in business?

If you are not really into computers how do you know what system to get, how long is this system going to be in use and what happens if the system changes and you have to change again with it?

The urgent care was using this EMR and it slowed their whole process down so they went back to paper. Some that are using it and are quite happy, but it depends on the system that you get and what kind of support you get. There are some I have heard that are thinking about implementing it and it takes about 6 to 8 months to fully get up and going. So I have heard both sides but I am concerned about how long these vendors are going to support you. And if there is an upgrade, what is their cost and will it be to your advantage or will it slow you down?

EHR adopters, like nonadopters, discussed startup investment costs but they tended to focus primarily on downstream costs. This concern was particularly relevant for participants who had received or purchased an EHR as part of a local program that predated the Medicaid EHR Incentive Program. Discussion centered on the unexpected fees for licensing, maintenance and technical assistance they have incurred and the reduced productivity that they have experienced.

Participants also discussed pricing options and strategies. Single-practice providers commented that the addition of an EHR means an additional monthly cost that will incrementally increase throughout the life of the practice. Discussion included the costs of server-based office systems and cloud-based systems.

For us, being a small private practice, one of our driving decision points was probably cost. Long-term cost and initial upfront costs; when we looked at some of the Web-based systems, you are looking at adding to your bottom line every month for the rest of the life of your practice. Like many costs, you can't anticipate that the costs are going to ever go down, so although there is an incentive out there to help offset some of these costs over the first few years, when you look at the support and all these other things—like after 6 years you are updating all your equipment and you technically need two servers if you have an office-based system. There is always going to be more cost involved.

Costs are very important because all of these EMRs, they price ... per provider. The number of providers [in my practice] goes up if I include my counselors and my behavioral health people... and that's very, very prohibitive. So I went with this [EHR vendor] because they were not charging us by provider, but charging by number of computers.

Participants also commented about the need to pay for equipment breakdown and replacement and added fees for additional functions. Some commented that they believed that once they got the system to function and they were productive again, they would be faced with another requirement that will add costs. Some participants noted that additional unexpected costs are associated with the integration of existing systems even if they are from the same vendor.

[EHRs] are supposed to talk to each other but they don't and nothing is set up and if you want to connect up to somebody you are probably going to get charged.

What I don't have on this EMR, is interface for my, the electronic EKG and spirometry and it just was so expensive so I just kept it on a separate, on a separate laptop and it works the same. We just scan those images in. And the alerts still aren't that common, so it's okay.

Transition costs were also discussed among new EHR adopters who noted that some costs are associated with the reduced patient load during transition and the increased labor necessary to get staff trained, to learn the new systems, to load medical records from paper into the system, and for other types of technical support.

It's been a miserable transition. We're still not there. It still feels like more work than with our paper charts. We're still seeing many patients who are not in the EMR yet, so we're faced actually with two systems. We're dragging around paper charts and trying to ... bring that information into the new record. I don't have labs and radiology yet, so it seems redundant and I still have a paper record and ... an EMR. It's just me and a PA and of course it's hit our productivity and so financially it's been quite a difficult quarter, two quarters. The financial impact of the Internet capabilities that we had to bring in, hardware, training, loss of productivity, it's been not economically friendly yet.

It is tough. If I had to hire someone to do it I couldn't afford it. My wife comes in and she keeps on it.... There is no way I can practice medicine and do it and I can't afford to hire a person full time to do this, which is what it has turned into. They have not made it easy in the least. They act like it is going to be easy to deal with the State and be reimbursed. They need to do something about how they handle the requirements. I am not saying the requirements are wrong, but the way it is being handled.

There was also some brief discussion of whether the promised benefit of adopting and using EHRs was worth the cost of the investment.

In the long run I would like to know how exactly this is going to improve things; where is the data that shows there is going to be a vast improvement? We have a list of hospitals over the last 10 years who have invested millions and millions of dollars on this; can we say it has saved lives or whatever and where is that data? Why are we forced into this and for what reason?

**Loss of access to data.** Participants also discussed their concerns about overall potential data loss. These discussions ranged from temporary access issues such as when the servers or the internet goes down, to power outages and flooding, to technical issues such as overwriting data or ghost cases to actual hardware crashes. These concerns were as prominent among urban as rural providers. Many providers talked about having paper charts with cursory information as backup for when things go awry. Others do not keep backup paper and commented that “sometimes things don't go right but that is rare and it requires a bit of flexibility on the part of the practice.”

When the patient comes in, I have the chart just in case. Like someone flooded the office a few months ago, everything was flooded, and so if the system goes down or there's a disaster...I don't want to be like a complete idiot, it's always good to have something on hand because when that happens and the pipes burst, and everything, everything is flooded.

I'll admit that also if the patient's new and well, and there's no medical problem, we don't generate a chart. If a new patient's complicated, we actually generate one, just like a folder and type out some key names, diagnoses, medical problems; there have been times that the server was down for a whole day.

Connectivity in general—it makes me crazy because if the Internet goes down or the server goes down, really there're no backups to get information. We have little backup packets so we can handwrite notes and handwrite orders and those kinds of things, but you can't retrieve any data.

I guess there were times when, you never were able to find a chart, or something, but to me I think it's worse, because almost always you could find a paper chart. You might have to wait for a while, but you'd eventually find it. I think it's a huge liability issue if you can't get to the patient's record and you're relying on that to be able to treat the patient. It's a huge issue. So just having a safe, secure, and reliable connection is essential. And it just isn't always there and the server can go down for a few hours and you're seeing patients all morning with no access to their records.

We don't keep any hard copies now, so, if the system is down, the system is down.

Data management, storage and retrieval, and migration from one system to another were concerns among EHR adopters, particularly those in solo practices. There was discussion about the way that systems store data and the challenges of finding where data are saved in a record. Participants were also concerned about system glitches that caused “ghost records” to populate

the system. For example, one provider found 12,000 lab results in his system for which the technical support staff could find no explanation. The only recommended course of action was to manually delete each of the 12,000 records, which was “very labor intensive.” Other providers talked about the challenges of backing up the data and ensuring that the backups are accessible and compliant with privacy and security regulations.

We are still transitioning, but I am very computer literate and I built my own server, I understand all this stuff and I did the server software. That is another issue—how do you back up your stuff? Are you going to back it up on a cloud and is it HIPAA compliant? Do you have a second server and you have that backing up and you have that somewhere else so you make your own cloud, what do you do? I was trying to put in more memory into my server and it went down and it was actually not the server, it was the screen, and it dawned on me that if my server goes down I am dead. You can't run your office without scheduling or something because here you have no charts so you have to think about another system that can start up immediately and you might have to have a second server in house, ready to go, and they don't tell you this—and no one gives you any of that information up front.

Why can't we migrate from one EMR to another? You cannot. If you decide to drop [current EHR] you can't really migrate that information to another one. This is so crucial, this is so important, and this is what you guys really need to focus on because it means portability.

It's a lot of work and if your computer crashes, all your data is gone, or is very hard to retrieve. I did go through a server crash. I corrected all my data but that was a nightmare, even with the best of IT guys. Not all IT guys know everything and to get the whole office network up and running was an unnecessary nightmare, which I never would have had to go through with paper charts.

Finally, several participants raised the concern about what happens to the record if the vendor goes out of business.

One really scary thought I had the other day that I had never considered, was what would happen if this company went under. What would happen to all my records, would someone buy them out? That was a really scary thought.

Also the longevity of how long a company is going to stay in business [is a concern], and some have folded up or purchased by another competing group. Now the rules have changed and the big fish eats the small fish and those who own the small fish system are at a loss.

**Quality of clinical documentation.** EHR adopters and nonadopters expressed various concerns regarding the experience of entering data into the EHR and the quality of clinical documentation produced by EHRs. Most providers agreed with the old adage, “garbage in, garbage out,” noting that documentation in paper records also varies in quality but that both entering data and using the clinical documentation from an EHR present some unique challenges. One commonly agreed-upon challenge is related to the ease with which extraneous information is included and then promulgated throughout the record via cutting or copying and pasting functions. This process creates records with a large amount of irrelevant information that then creates a challenge to reviewing the vital patient information. Providers commented that this can be merely annoying and time consuming to potentially becoming a safety issue.

#### Adopters

You're either only going to be including all this fluff. And by that I mean a kid comes in with a sore throat, and by the time you click, click, click, click, you have all this rubbish. It's going to tell you about the abdomen and stuff you haven't examined, okay. And then you might miss something because the kids got a cold and if you didn't remember to check the fluff that they have in there, you're going to see, no cough, no cold, ...it's absolute rubbish.

And indeed the reports that I had from one doctor, in particular, were garbage. Did he ask all of those questions? He would have been in there for an hour. But it's too easy to just say, “All of them.”

I read H and P's [histories and physicals] from outside sources that use these systems and it's crap, to be quite honest. You can't use it. Because somebody set up the text that said, pupils equal, round reactive, blah, blah, blah. And somebody just goes click, click, click on the things that are pertinent to them... First of all, it's 7 pages long and you don't trust any of it because they've documented stuff that was completely superfluous and haven't adequately documented the thing that you wanted to know about.

#### Nonadopters

I have a lot of physicians who send over printouts from their EHRs...When you are trying to extract a lot of information from it quickly, a lot of it is very boilerplate information such as do you smoke, do you use alcohol, do you smoke six packs of a week or how many packs a week? This is the information that is being sent over on a 6-month old baby.

There is a temptation to use the boiler plate H and Ps, and you have to go through reams of paper to get down to the diagnosis to complete the plan. All of these are depending on which plan chart you have selected and you can have five or six pages worth of information for a visit when really the substance is lost. The point that is lost in all these irrelevant statements...

A kid will go to the ER with fever and a runny nose and the electronic record where they are seen generates a six-page report. When you look at the review of systems it is kind of like it fits the 2-year-old into a template of adults and it says stuff that is inappropriate. You know they didn't ask that of the kid but just checked it on the template. So that is something I find not too attractive from my experience from reports generated from electronic medical reporting system and sent to me. It is hard to hone in with a five-page typed report. It is almost cumbersome and you can't even find out what antibiotic the kid was given. Lots of times there is information there that nobody asked for.

EHR adopters also reported concerns about shortcuts taken because documentation takes longer to complete. Many participants in the groups expressed this concern. Some indicated that they were documenting on paper and then entering the information at the end of the day, which creates an opportunity to introduce error into the record—either recall error or entry error. Both types of errors may increase if the provider has office staff performing the data entry.

However, you know, they [EHRs] do take longer...and what happens is that...a lot of people ultimately cheat [to save time]...because they will build templates...and that template that they use may not really reflect what's going on with that patient, because every patient is unique. And I've seen electronic records that I know are not true, because the [provider] has just imported a generic review of systems and the patient has urinary tract symptoms but in the review [of systems], it says no urinary problems. So this is one of the problems with EHRs, is that...they are a bit more time consuming because you're going from window to window, and the way people bypass that is with the templates...So,...even though this problem listing may seem a little bit picky on my part...I think...when I don't get credit for problem lists on my score card, it's really because I have not gone into another window that says 'no problems.' You know, it should be made a little bit easier.

A number of adopters and nonadopters alike commented on the way that clinical documentation in an EHR is structured in that requires retraining how one thinks about documentation and the impersonal nature of the computerized output. Some felt that they lost important cues about the encounter and the patient, in essence creating a very generic, impersonal view of the patient.

#### Adopters

What I missed the most was that I sometimes I like to draw the part of the body that's involved and a little bit of what, like lesions or whatever it looks like, and I can't do that on the electronic charting. I have to literally describe everything in words.

You have to select templates and you have to...really change your way of practicing medicine in a lot of ways. Because you'll have to all of a sudden go from being very personality-driven in your notes, to being very cold in your notes. And I think that there's a lot of liability in that and it's really hard to overcome and

put your personality on to paper.

You're held accountable for that information, and the other drawback is that if everyone is not on total board with where to find things, where your allergies are listed, and are they listed on every single page, etc. I mean if you're trained to do something—this requires retraining the brain, because you're held accountable for every single thing on every single page. You just have to come up with a whole new set of ways to detangle yourself from the snag, I guess.

And then the consistency of usage. When you have a really large site with multiple users and you train every one, there's slippage and some people will start to not document consistently in the way that we all want them to. And so that's what's really hard is getting people to use the EMR consistently. For instance, making sure the [front desk] gets X, Y, Z, parts of the history when they check a patient in every time. Always recording allergies, or putting no allergy when there is no allergy. Those things were difficult at times.

I agree...in the fact that everything is very generic in there. There is no place to really add a comment, or really talk about how the patient was reacting to anything you said or your exam.

It's comprehensive although I feel like the personality stems from—your pertinent positive and negatives—stem from you as the practitioner, and that's what distinguishes your exam from another.

Nonadopter

I'm one of these people that if write it, or if I see it on the written page, whether it's me writing or someone else writing, then I remember how that was written. I remember that patient more. But if you depersonalize everything, then we are just looking at a computer screen and what we're doing is essentially trying to get the bottom line, trying to get ourselves paid. And that's a less ideal place to be. I just think again, you lose your personality, and I'm just more fearful that we're all going to have to do it, and so that's why I'm motivated, I guess. My motivating factor is if we're going to have to, then I'd rather do it with fewer charts. I do definitely feel bad for the practices that have, that have tons of their charts and then when they remember how things were laid out in their chart and this and that, it totally reorganizes everything. So your mind has to think differently.

In addition to challenges with entering information into the EHR, some providers reported challenges with retrieving information easily and with being able to validate that the information retrieved is accurate. Adopters and nonadopters alike reported being concerned about the use of smart text and cut-and-paste errors, and internal system errors.

#### Adopters

To me, if it's not asked and not done, it shouldn't be in the note. But some people click them anyway and you end up with a lot of words that you have to go through to find important things. When you type in something that's positive in a review of systems, it should migrate to the first part of that review of systems so that you only have to read the positives. Leave the negatives for the lawyers and that would save the doctor's time. It can either be in a different print, could be a different font, it could be moved to the front but some way to pick out the positives without having to read through all the negatives. When people click something and put 120 words up and all I need to know is that the person has conjunctivitis. I mean, it looks beautiful on paper, but it doesn't make medicine better...because I find most [providers] are ignoring the [histories] because they know most of the people just click on the things.

...it is always this process...you start out and get everybody in and start that initial visit but then when they come back you are learning again, "where do you look back for this information" or "how do I find something else?" The more we saw them [the patients] the more we were finding that there were bugs in our system. ...It took so long to see that there were actual discrepancies in the data collection, not on our part but in what the system was doing but it took a while to see that. If we are seeing people as a GYN office we might see them every 3 or 6 months and we would bring them back maybe a few times a year and we would see that now we have to know how to take the information from their previous visit, bring it forward so that it is usable in that visit.

I have a patient that has this rare neuropathy and somehow it got coded as a diabetic neuropathy so he comes up on all the diabetic markers for all the clinical indicators...so he gets literally all the mailings, all the follow up reminders...and he doesn't have diabetes, he has this other very rare form of neuropathy...He shouldn't be hearing from other people about adult diabetes which he doesn't have. The problem is once you're stuck in a system, it's hard to get out of it. It's hard to re-label people that have been labeled. Not misdiagnosis, mislabeling. It wasn't a clinical error but somehow it was an input error and somehow it got put in the wrong place.

I was doing coding and I made a mistake and had a twin preemie and I wanted to identify it as twin A and I put in a code and was told I couldn't use that code. It screwed up the entire claim and I had to delete it and start over again. In my experience with EHRs they expect the codes and [our vendor] even told us that we could take a free course with the State. That is not what I got into this for.

As far as the history and physical goes, the EMR we use does have a function where you can use smart phrases and smart words so you don't have to do as much typing, and there's also a click sheet, but that does sometimes turn into a paragraph that's not very readable and it sounds like a computer.

#### Nonadopters

In the EHR they try to write down everything and it comes out jumbled. The terms are in an order that none of us are used to and one item on a page that should follow something on the previous page and it just doesn't make any sense. I think there are dangers involved and a lot of complexity, and frankly I don't think any amount of money would be worth it at this point.

Among my associates' referral patterns, those physicians that got computers a long time ago had great facility with their computer and specialty designed programs and I love getting their records and interacting with them and it is very user friendly. Among those that have recently gotten computerized, who are not savvy with computers, as I am not, it is disastrous. The reports are horrible and getting the reports from them is horrible.

...in these computers sometimes while you're typing it will insert a sentence into a sentence that's already there and start spreading them left to right and you've got to find out where the sentence was inserted and erase that and then bring it back to where it should be. They also added a little blue box. If you click twice on the little blue box in the history of present illness section and if you type into that blue box, it erases everything you put into your history of present illness, everything you've put into your free text, and that was the updated system they brought in. And there's no cancel, there's no X to cancel this box. It just automatically erases your history of present illness, automatically erases your free text, and you can't do anything about it. You have to go back and retype it all in.



**EHR usability.** EHR adopters and nonadopters expressed concerns and frustrations with EHR usability. Participants indicated that they want a system that is intuitive, easy to use, and does not fragment the information that they want to review for a given patient.

...I wish it was just like my iPhone. So, as I look at programs, I'm going to be choosing a program [to replace the current EHR] that I think that is going to be the easiest for people to adopt, and the easiest for us to share information, and the easiest to e-prescribe, and just, overall just easy. It needs to be user friendly.

The reason I like the system that I'm getting is I really believe that this one's intuitive. Yes, I'll need to be instructed, but leave me alone and I'll probably figure it out. I know that it's a change that we have to make and I'm willing to go along with that. I'm optimistic that the promises of this thing will come true, and I think that mine already has a great deal of integration that it's capable of.

Nonadopters expressed concerns about adopting and using EHRs. Some of these concerns were expressed in terms of being frustrated by the thought of using an EHR. Many providers agreed with the focus group facilitator when they were asked if any EHR functions were intimidating.

Nonadopters

The intimidation would be to enter all this data in there, every time—especially the medication. ...you have to do it on a screen this time and the problem is it's going to be different each time. Some of it's the same but unless you just copy [and paste] which might be an option. ...So I'm not sure it's all intimidating, just the volume of the data that has to be entered is what intimidates me a little bit. Because I think it's going to be very time consuming.

I'm not sure what would be intimidating? I guess just using it enough that I can do it fast, so we don't forget. The thing with the EHR is that you have to do it constantly to remember where you need to go to do what; It's my least favorite software. And I'm afraid that if you don't use some of the features, then we're going to forget how to do it and then I'm going have to call someone to ask them that. How do you do this again? Things like that.

The other problem is that you lose the ability to flag things. In my email I can flag certain things but it is not like when I put a big red sticker on it so that I don't want to miss it when that patient comes in again. It is obviously on a paper chart but on an electronic chart I don't think it is that obvious. You would have to do a lot of searching, especially if you have seen that patient for years and years.

I find computers very frustrating and it certainly does not help me when I am trying to have an interaction with a patient and understand what they want and actively listen and provide them with what they want.

Since I am not good with computers, I find them frustrating and what I could write out in 30 seconds sometimes takes me 10 minutes on the hospital computer. The screens are so packed with information that are extraneous to me that and makes my eyes go gaga and it has never been a pleasant experience doing e-prescriptions in the hospital.

**Lack of interoperability.** Nonadopters discussed their concerns about the lack of interoperability among various systems both within and among various specialty practices, laboratories, pharmacies, and emergency departments. Clearly, some participants felt that an EHR that cannot transmit or receive information does not accomplish the intended objectives of improving quality and reducing costs. They were also concerned about the difficulty integrating scanned information into an EHR. Finally, they expressed a feeling of being overwhelmed by the sheer number of connections to be made to achieve care.

#### Nonadopters

We speak in so many languages in this EMR that sometimes one system does not communicate with the other or the hospital's EMR does not communicate with those in private practice...If...everyone wants to go with EHRs, is there a reason why they don't have one uniform system that speaks the same language to reduce the burden of us choosing from 700+ certified EMRs?

I was at a meeting last week and somebody had voiced the same concern: why isn't there one system? The guy sitting next to me was in charge of putting these in for the military; they had their own type of design and they finally worked it out but it took a while. Why not have one common system that everybody could use so if doctors moved around or if we want to read someone else's EHR, we can use it? I am an obstetrician, and in the hospital they are just instituting an EHR but for obstetrics we have our own program. We are not linked to anything in the hospital and we cannot access the computers. I think with the differences in specialties and locations there is a lot of work that has to be done and it is really overwhelming.

These are multiple systems and if they don't cross communicate with one another it concerns me. Just meeting the MU requirements in each specific thing is one point, but the ability to communicate from physician to physician, physician to lab, or physician to ER, and physician to hospital is crucial. And how long will it take for everyone to develop the skillset required to communicate efficiently with nothing lost in the translation or nothing wasted in [terms of] the time that it takes to get all this information? These are my concerns.

It's also been difficult because not everyone in our area (we're in a rural area) uses EHRs. It's trying to figure out how you integrate referrals, and how you integrate reports from specialists into the system. They end up being scanned, which is then not very useful. And so it's tough when not everyone is using the same system, or any system at all, to actually have a good cohesive record if the patient leaves your office.

I know that the answer at least with emergency departments is we get reports that either are handed to us or faxed to us about whatever the [patient] sought care for. It's hard to go through them. It's quite tedious. You know, if someone faxes over 10 pages, who decides which of those 10 pages goes in[to the system]? Is it the whole thing? Then you have these varied awkwardly large groups of big scanned files that you're trying to look for. On the second page from the local emergency room it always says what medications they were given or what their chief complaint was when they arrived. It's harder sometimes to actually go through those documents when they can't be integrated into the system.

## **Implementing EHRs: Common Processes and Barriers**

### **Time to Become Comfortable Using EHRs**

The majority of participants indicated that it took them 6 or more months to become comfortable with using their EHRs. There was no difference between providers in private practice or at CHCs or RHCs. Participants noted that system technical problems had to be overcome before they could explore the functionalities available to them, such as creating their own templates. Another issue raised was difficulty learning the icons, screens, or abbreviations that the system used. Very few participants explicitly said that it took them more than a year to become used to the system, but many of them said their EHRs had more capability than they were using.

I would say it was probably at least 6 months. Maybe longer. I mean I think I got the gist of doing the basic, you know, relatively early on because there was no choice. But now I feel, I feel comfortable creating my own templates now.

I think someone mentioned that there were the abbreviations and things. That's why I said in the beginning, I'm not using everything I could be using, cause some of the stuff I don't know what it is. But, for the important things, the things you listed and the things that people added, I'm able to function barely, but I only know about 75 percent of the program.

Yeah, I think everyone had lack of confidence at the beginning, and you felt like you didn't really know where to look in chart for the information. So then, you would kind of keep relying on the paper chart until we finally just got completely rid of the paper chart. So, yeah, I think to build your confidence, or be able to rely on the data that's in there, probably took, I bet, 6 months to a year.

## **Usability of EHRs**

Even those who have been using EHRs for more than 6 months had concerns about how they used EHRs, often blaming the system itself for their lack of proficiency. A much smaller number of providers praised their systems for being easy to use.

I end up probably not using either of my EMRs correctly...because they're not intuitive; they are several clicks away; they are hidden.

And they use a system, ...and it's just completely anti-intuitive. I don't care how long you stare at that, you can't figure out how to do it. You have to get someone to show you how do it.

I absolutely detest electronic flow sheets, and I freely admit it because I don't think you get the same view that you get [when you have the data] in one place [where] you can quickly scan it...digest it and move on. Whereas in the database world, you can see the blood pressure, but you can't see the heart rate. You can't see the respiratory rate...You can't see how much fluid is going into the patient. These are all disconnected. And so you can trend certain things out, you know, give me the heart rate, the blood pressure, and IV rate, but I have to manually select that, and so it's not as simple ...

...I think, you know, each EHR has to be as user friendly as possible, and that one should have to go through a minimum [number] of windows in order to accomplish what one needs to accomplish.

[I like]...that on your sheet as you type, you see the diagnoses all on one side and you see the all drugs listed that the person's on in the right hand corner. They also have a little area at the top of the page where you can type notes to yourself so that if a person is a drug abuser and you want to talk to the family about substance abuse, you can write down "no controlled medications."

A few participants made comments related to some unique issues they have experienced with various EHRs that can create system errors if not navigated carefully.

Now the patient demographics...I don't know if that's on everybody's computer, but at the top of the page, when you're doing review of systems, there's a white bar that covers up the patient's name and the date. Here's the thing...you have to click that off [to see the name and date] and I think that's a dangerous medical legal problem. I don't know if it's on everybody's computer, but for us, especially when we're doing the history of present illness review, we have to click this white bar and nobody knows what it's for and have the name and the date show up.

I don't have a way to leave notes to myself, and the coding system, like I said, when I put mitral valve prolapse, it prints out on my sheet as "prolapse of posterior leaflet of the mitral valve" instead of MVP. It still prints out this word system that goes onto my documentation that won't even fit, so I think those are some things that there are problems with.

## Workflow Changes

Providers did comment that they sometimes create workarounds for some specific functions that are not easy to use or do not adequately provide the necessary functionality. Sometimes these workarounds are done in the system and sometimes they are accomplished with paper supplements to the EHRs.

The program I'm using—it doesn't really have a good problem list, so I put people's problem lists in their demographics. Like there's room for notes on the side and that's where I create problem lists—on the side, kind of like a workaround that I'm doing.

"[The] OB [system implementation] was pretty quick, but it still does not do what we want it to do and we are still photocopying the records and taking them to labor and delivery. So the whole selling point of EHRs doesn't do anything and writing is better. If you have a patient that is on the way out and [she] comes back and talks about something else it is like "no you can't, you are already out." It is a nightmare.

**Additional time to use EHRs.** In nearly every focus group of Medicaid providers who currently use EHRs, participants reported challenges in using the EHRs because more time was needed to complete clinical documentation in patient charts. All provider types except dentists mentioned the increased burden of documenting clinical information in EHRs. Participants frequently mentioned that they spent time late in the evenings or over the weekend to finish entering patient data into their EHR. Some participants expressed frustration that this took away from time they had to provide clinical care. In cases where there is available information on the time since participants adopted their EHRs, it is clear that even EHR adopters who have used them for more than 3 years report that charting in an EHR takes more time.

...a lot of times I feel I am a verified and over qualified data entry person. I would rather be spending my time helping patients rather than entering data.

I actually get behind at times to where I actually write everything on paper and spend 2 to 3 hours a night typing in my notes because the computer is so slow and cumbersome. And I find, at many times, by the time I get to the screen I need, I've forgotten what I want to put in it.

That's my main problem, is the time it takes to enter all the information and diagnoses and physical. Taking more time in entering the information than checking patients, so if I see patients for maybe 15–20 minutes, it takes me about 30 minutes to enter the information in the computer sometimes.

That's why I take all the papers home at night and type them in because they take that long, and you're absolutely right, you cannot possibly do it at the time, in a timely manner and keep your office open; it's impossible.

A number of participants reported that using the EHR caused changes in their routines that added time to the process, and in some cases, contributed to feeling somewhat less confident in their ability to interact with patients in a meaningful way.

I used to draw a lot of pictures. It's very difficult to draw the pictures in [the computer] that I used to draw and that would help me with a lot of my recall of where an injury was, where the problem was. Finding it very difficult. With writing I can see probably 40, sometimes 50 patients a day. With this machine I can see 29 to maybe 32, if I'm lucky. And that's with bringing things home. And it's very frustrating.

But everybody has their own plan, like the doctor said he likes to draw little circles and little diagrams for himself so when he sees the patient 3 weeks later it refreshes his memory. Everyone has their own plan. I used to have my own plan. Obstetrics, say check blood pressure, start Valtrex at 32 weeks. I was giving myself little hints so when I walked into the room, I would look at that list and...I wouldn't look like an idiot. But, now I look like an idiot. I go in there and kind of try to get the records. I don't have these little notes to

myself. You have to click 15 times to find where you're going. There are multiple things you have to look for, whether it be anemia in pregnancy or the patient has preeclampsia in the last pregnancy, and you have to watch out for it. I feel like I have lost control over everything. Instead of being the person in control, I feel like the computer's in control and I'm tagging along. I've just lost my ability to be number one and the physician has to be on top of everything because he could make mistakes very easily, and I just don't feel very confident in it. Maybe in 6 months, maybe a year, maybe the computer system will be better, the templates will be better; I'm sure they will. Maybe I will feel more confident in myself. But right now I lack total confidence in my ability to take care of the patient using the EHR.

Someone said it's only 3 clicks [to get to what you need]. Well, multiply that by a thousand--and then you get click fatigue. You think, hey, I don't have time for this. I just want to treat this patient, get this patient home. They're sick. And I've got to do 10, 30, 50 clicks to get the information. The system needs to have the diagnoses on the page where you can see them. Otherwise I feel like an idiot; for example, if a patient had a hysterectomy and I ask when they had their last period, and she's been my patient for 10 years. I should know this or the record should show me. The record used to have a list on the side where I could look. Now I've got to click into the diagnosis thing, look at those. Then I've got to see what medicines they are on, see if they're taking those. And I have to go and click into each one, where before, ...a page with the diagnosis came up...[with] all the drugs,...and a reminder box was fabulous. Big pluses for that system and it made me feel better. Now did it make my medicine better? I think it did because I could see everything that was wrong with that patient with one look.

...it's not always easy to find the proper diagnosis and there are two different places for it to go. There's a significant diagnosis and then a past diagnosis. And that makes it a little bit confusing if you want to just really look at both of them to see if you missed something.

And then the medications—It's very time consuming when you have multiple medications. You either e-prescribe to refill them or when a patient is requesting refills. And when you discontinue a medicine, on the right hand side of the screen. the discontinued items are probably 9 inches away from the actual name of the drug and there are no lines or shading to separate it. So in the middle of the column you really aren't sure which one you're really clicking on because you can't tell which medicine you're really discontinuing.

And then medication allergies—in our program it is difficult to tell. When you're looking at the prescription list, all the names of the medicines and allergies are written down the middle of the screen, but the actual drug allergy is way off to the side in very small print in black. So you actually have to go looking for it instead of it being very obvious, like you would normally have on a paper chart.

Some participants noted that the EHR was slower to load and, therefore, less efficient than paper.

Even flipping through a chart to see if someone did a mammogram is sometimes a little tedious when you do it online, and the images don't come up so fast and it is slower—it depends on how fast your computers are.

Over the last 5 years I had to keep adding memory and updating my servers several times because they're bringing in every upgrade of the next portion that has more features, which means it slows down. Five years ago actually my EMR was much faster because now they've added so many new features, it's slower. Of course [there is] the additional expense, and imported items take a while to load while we are sitting with the patient and especially patients who have a lot of problems and complaints; it takes a while to load an imported item, look at the X-ray report or lab report. It's kind of more time consuming, waiting for it to load.

The real limiting thing was just very cumbersome, slow moving, tedious...It just held me up too much. It prevented me from doing what I do and how I get paid.

I bet your software people did not tell you when you bought them what kind of a memory hog these programs are. You need gaming computers to run them, and that is what I am finding out, that I need more memory and RAM than what they recommended.

Participants frequently mentioned the time it takes to click from one window to another to find all the right screens in which to document patient information. The available data suggest that there is a direct relationship between the time the provider has been using an EHR and the frequency with which this was mentioned as a barrier; EHR adopters with less experience reported this concern more frequently than EHR adopters with more extensive experience.

I think just getting use to where everything is located. I mean, it's very much like a video game. There're so many little buttons and you don't really know what to push.

So this is one of the problems with electronic records, is that, you know, they are a bit more time consuming because you're going from window to window...

The drawback to that though is, you have to fill out every one of those specific areas, and if you don't, it comes back with a, "You have to repeat this," or, "You have to finish this," and it is very time consuming in a very busy practice. You just really don't have time as this point to go through each window.

...as we all are, our mind is 10 pages ahead of what we are doing, and we have to slowly hunt and peck to try and get the information down. It is slow, but as we go along, it will get faster, but it is going to take time. In the long run, it is going to be exceptionally better because of all the templates we use, not only because we won't forget things, but because [we] will be able to document the stuff that is expected that we do document.

There's a lot of back doors in the system I'm using as well. It's cumbersome. You really have to...know where you're going. You have to have done it 19,000 times in order to know how.

I keep on forgetting about...the "problem lists", because you have to go through two windows in order to say the patient has no problems, and I just forget you know, because that's just extra work.

**Added burden to workflow without clinical benefit.** While some participants noted the benefit of using templates to improve documentation overall, more often (in almost every focus group of EHR adopters) the concern was expressed that providers were taking more time to document extra information for the sole purpose of meeting Stage 1 MU objectives. They noted that if their clinical documentation was incomplete, they would not get credit for meeting the targets for Stage 1 MU criteria—even if they felt that certain items were not relevant to the clinical care provided at that visit. This concern was most frequently mentioned by pediatricians, the certified nurse midwife, and physician assistants, but was prevalent among many participants.

Things that had to be done, like verifying the problem list each visit and verifying the hospitalizations and certain—there's an extra box that has to be clicked. Even though you check it, and it's in your notes, if you don't click "verified" at each visit, that I guess impacts in a negative way your MU criteria. And the same goes for the problem list. It has to be updated at each visit, but I didn't realize we had to check "verified" at each visit. So we do have someone now working with us to meet those criteria.

I probably mentioned while I was talking about the different MU functions as I was talking, some of them are useful, no doubt, and more and more of the medicine is now being dictated by the government. I would say to do stuff in a, you can call it template format, or protocol format, and losing our clinical touch and getting into more asking the same questions over and over, concentrating more on entering the data in...the actual medical practice is suffering...Not everything is silly, but I think it could have been better.

So there's so many things you got to go through [for] MU. Sometimes I feel it's useless and unnecessary, but you know, that's what you got to do to get the payment and it's more of a—. I would say it's more of a burden to do every single thing. Some are useful—electronic prescriptions and all that stuff is understandable, but you know, asking smoking every time, and checking all these things, putting all the codes, all these MU codes...I think they're a little too cumbersome to run a private practice profitably.

Do I think that it makes better medicine? I've looked at some of this. Some of it does and some of it I question. ...Who's going to read this stuff and make this better for medical care for our patients and not just for statistical stuff? I do think that it's cumbersome.

**Workflow workarounds.** This practice was mentioned in over half of the focus groups with EHR adopters. Some providers mentioned this workflow practice in the context of needing to stay on track with their patient visit schedule. Others noted that it enabled them to have more interaction with the patient during the office visit.

Some providers reported keeping some paper charts for various reasons, ranging from having backup documentation if the EHR went down to (more commonly) being in the midst of transitioning from paper to EHRs in a series of steps, as new patients join the practice.

Often times what happens is if the office is really busy and I don't like to see people wait for prolonged periods of time...I will...see them without doing anything in the computer, and then I'll do it later on at the end of the day, or the first thing the next day, which is really suboptimal.

Some people the first few months preferred to still do their visits face to face and then run to their office to chart rather than charting in the exam room at the same [time].

When I have a medical student I have them write it on paper, and I put it into the computer later.

We can't possibly document right [there] and then, not look[ing] at the patient at that time, so we write down [our notes] and then go back and dictate everything.

When we first started, I would take the computer in the room with me, and I found myself clicking and trying to do the computer. So I just left it on my desk and talk[ed] to the patient and [then] come back and enter the stuff. Otherwise clicking on the computer becomes too impersonal.

The other thing is that when I do home visits, I use the laptop, and that has gotten to be so onerous that I give up on it and write everything out by hand, and when I get home, I do the notes on the computer but I am on my own time and I don't get reimbursed for that time so it really pisses me off.

## Use of EHRs in Multiple Locations

Several participants noted that they performed hospital rounds and, therefore, were using different EHRs in their own office than at the hospital. Of the few in this situation, they more frequently expressed frustration at not being able to transfer information from their office's EHR to the hospital's, than about any difficulties having to switch between systems. One participant noted that she did not receive any training on the hospital system, and another noted that it was a challenge to become familiar with systems that she used infrequently only on rounds. Several others felt that most EHRs were similar enough, and switching between a hospital-based EHR and their office-based EHR was not a problem. Overall, this issue did not seem to be a significant barrier to meaningfully using EHRs in either setting.

## Patient-Provider Interaction

In 7 out of the 12 focus groups with EHR adopters, participants mentioned that their use of EHRs negatively affected the way they interacted with patients in the exam room. No dentists, physician assistants, or certified nurse midwives reported this problem, but the sentiment was common among physicians and nurse practitioners. Only one participant mentioned that using the EHR in a tablet format enhanced their ability to communicate with patients, by being able to show blood pressure readings or laboratory results over time. On the whole, this issue was raised consistently as a concern about implementing EHRs, both from adopters and by several nonadopters.

A lot of my communication is nonverbal. I'm feel like I'm missing the things that I used to be able to pick up. I used to be able to talk. For example, with a mom who's on the verge of tears, I could sit down and say, "What's the problem?" and find out that her husband left her. Now I'm too busy with the computer. I'm missing some of the important stuff.

Get yourself wireless and don't get stuck to the wall so you can look at your patient in the face when talking to them. We teach medical students how to do this at the same time and we don't want them to be tunneling through templates while the patient does not get any eye contact. It is a big problem in primary care: the doctors look at the screen and not the patient.

It's very difficult... talking to a patient, putting your hands on the patient, listening to the patient, and most important, at the same time, typing and trying to formulate something in your brain to take care of this patient. There are just too many things on the plate.

You lose that physician or provider/patient contact because you are constantly looking at the computer screen and patients want you to look at them. They want you. They want that eye-to-eye contact; they feel that if you're not looking at them, you're not listening to what they're saying and that is a problem.

## **Characteristics of Medicaid-Insured Patient Population**

When asked whether they faced certain challenges in implementing EHRs or specific EHR functions because of characteristics of their patient population, some participants noted a few key issues. Several participants identified difficulties in following up with patients because their phone numbers frequently changed or phone lines were out of service; these were barriers to sending reminders for followup appointments for preventive care (a Stage 1 MU menu set objective.) A few participants reported that their patients could not use the online access to their health information (a Stage 1 MU menu set objective and a proposed Stage 2 objective) because they lacked Internet access; one rural provider and two urban providers mentioned this issue. A few others mentioned language barriers, or computer literacy of older adults, as a barrier to patient engagement activities such as benefiting from patient-specific education or using a patient portal. Other concerns are relevant to this study because they affect pediatricians, who are eligible only for the Medicaid EHR Incentive Program. For example, some pediatricians were concerned about whether computer equipment could be left in an exam room where small children were waiting, or whether adolescents should have sole access to their electronic health information. However, other participants noted that the issues of moving frequently, changing phone numbers, Internet access, identifying pharmacies to which electronic prescriptions should be sent, and forgetting medical history would apply to patients insured by Medicaid and private payers alike. Thus, these potential barriers to implementing EHRs may not be specific to providers eligible for the Medicaid EHR Incentive Program.

## **Using Structured Data**

Because of the ability to codify clinical data in a structured format—so that it may be analyzed and reused for quality measurement, quality improvement, tracking values over time, data visualization, and other beneficial uses of EHRs—focus group participants who adopted EHRs were asked how they felt about using structured data in their EHRs. Many participants, across nearly all focus groups of EHR adopters, expressed both positive and negative opinions about structured data—often in the same response, noting its benefits but also its limitations. Physicians gave slightly more negative comments, while dentists, physician assistants, and the



certified nurse midwife provided slightly more positive comments. However, the people with positive comments often had negative comments as well.

Positive comments about structured data included—

- Ability to create growth charts and charts of vital signs across visits;
- Ability to select diagnosis (e.g., ICD-9) codes;
- Prompts in templates to ask certain questions that could otherwise be missed;
- Ability to generate quantitative reports on a patient or group of patients;
- Correct spellings of diagnoses entered by others (from preexisting menus);
- Decreased medication errors due to selection of medication information from preexisting lists;
- Consistent position and format of key clinical data across all charts (thus improving quality of documentation); and
- Activation of clinical decision support tools such as checking for drug-drug interactions.

We like it, especially for the height and weight figures, for growth of children. It makes it a bit easier to find out are they growing, if they are behind, or if any problems exist in their growth and development.

Now that we have it and it's added this bit of structure, it is kind of nice, especially when we get through these little hurdles of how to utilize some of this stuff. It would be nice to be able to quantify a few things, and get a little more organized with our numbers and things of that nature.

Even though it was tedious, it was very comprehensive, in that it addressed every system, every organ.

For medication and medication allergies, I think it's really important to put that into the structured data because that's where you get the medication interaction lists that are generated and those pop up in red. Let say, someone accidentally prescribed penicillin for a child who has an allergy, then that data pops up in red—so it's important to put that in the correct box for structured data so that [you] can get those interactions. Because if it was placed someplace else, you may not get that information.

Negative comments about structured data included—

- Inability to find correct diagnostic code;
- Inability to find correct medication, especially when preexisting medication lists are not updated frequently enough to keep up with advances in clinical care;
- System does not provide appropriate units for height, weight, medication dosage;
- Time it takes to both (a) click through all fields requiring structured data, and (b) set up templates;
- Inability to annotate data in free text fields (in some EHR products);
- Frustration with available billing (ICD-9) codes not matching with terminology commonly used by clinicians;
- Frustration with time it takes to describe a problem such as a lesion or laceration using multiple drop-down menus that explain location on body, size, and other features—rather than writing the description more directly or drawing a picture; and
- Challenge in not being able to receive laboratory results electronically and, therefore, needing to key in laboratory results from paper faxes into structured fields (a Stage 1 MU menu set criterion) that could result in errors.

Sometimes if you're looking for a particular diagnosis, [the system] has perhaps 30 diagnoses related to that diagnosis, and you have to go through them all to find one that fits you.

The drawback to that is that you have to fill out every one of those specific areas. If you don't, [the system] tells you that you have to repeat this or you have to finish this. It is very time consuming in a very busy practice.

There are times when I guess they put the dosages and [they] may not be appropriate for pediatrics, so you have to be kind of vigilant so that you don't send off the wrong dosage, because the dosages are sometimes are being populated before you send the prescription.

We also had some issues with specifics on the way the data was getting collected. Height was to the nearest inch, which is unacceptable to us, and I don't know why it would be acceptable to anyone else using the software.

## **Health Information Exchange**

EHR adopters reported that their most frequent electronic interface was with laboratories (to both send orders and receive reports), followed by some reported interfaces to receive radiology reports. The ability to receive information from hospital systems was mentioned infrequently (and only among providers in private practice). Although many participants reported they could incorporate electronic data from laboratories into their EHR—especially among providers in health center settings—more participants expressed frustration at the expense of creating interfaces between their EHRs and laboratories to allow that type of exchange. Providers in private practice were among those who cited this interface as cost prohibitive. Additionally, even participants with interfaces with laboratories reported some problems such as inability to order lab tests all the time or to order only from a limited set of labs.

I have a bidirectional interface with one of the labs and I expect the second lab to start any day now.

I can actually log into the hospital electronic system and look at everything, but it is not bidirectional. I can only look at them. And then I can copy/paste if I want to, but the medications do come. I can import. If the patient goes, for example, to the emergency room and fills a prescription, follows up with me 2 or 3 days later, I have a button that says import medication history. It actually gives me the medication coming into my system.

I work with a local hospital and we have been live on that hospital system since June of last year. If you happen to be a physician in private practice, you are on the same EMR but some exchange of information is feasible. But if you are on a program that is different than the hospital's, you don't have the software and bridge to transfer the information.

We order labs through our system. They sometimes arrive electronically to the service center, but sometimes not. So I still print the paper copies because it's just a hassle to find out after the fact that they never got the order electronically. That's actually a big problem for us. But we order the labs that way, and then we get the results through the system too.

Everyone wants a chunk of money to set up an interface and we had so much difficulty trying to negotiate with some of the labs, with the hospital especially, regarding how to get it done and what it was going to cost. There were interfaces on each side—one with the software vendor and one with the hospital, one with the vendor with the lab and everybody was quoting different amounts of money and different time frames and nobody was talking to each other. We just threw up our hands. So unless it is mandatory or someone is saying, we're doing this gratis for you, we hit a brick wall or a barrier.

Both EHR adopters and nonadopters expressed a strong interest in the ability to transfer data more easily across health care providers and provider systems, and expected that EHRs should make this easier to do. However, the lack of ability to interface with other health care providers electronically was noted in nearly every focus group. Some participants indicated their optimism

for a time that EHRs would facilitate faster and more efficient communication of patient health information with other health care providers; others were skeptical that this type of health information exchange would become readily available in a free market system in which providers were using a variety of proprietary EHRs.

The whole system with the EHR was set up to share the medical information to improve care and to cut costs. But unless we actually have one system, universal, so whether you're in the North or the South, you can log in and get the information. It's useless because if you're using [one EHR] and I'm using [a different EHR]...there is no communication.

I think if there was one thing that I as a practitioner would like to see, it is a universal database so that, if John is my patient—I type in his social security number or patient identifier, or whatever gets me that and all of his data is available to me as a practitioner. And what that gets for my patient is: they won't have to tell me and 19 providers that they have that they have hypertension, that they're on Lipitor because the database in the sky will have this information and it should be accurate. So, that to me is the real, "Aha, wouldn't I like this?"

Our office is an island as far as communication is concerned. Even with the ER [emergency room] we are supposed to get records without even requesting them because we are primary care but they still want you to fax over the patient's signatures and wait. If we could access that data, it would be beneficial, but we cannot.

I feel like with all these electronic medical records, it's like 200 different languages have been created and they all can't speak to each other. Between all the different hospitals and followups with patients, we still rely on everything faxed or mailed. These systems don't communicate with each other. The hospital-based folks have it better, but in isolated practices like mine, it's just a bunch of different languages and they don't speak to each other.

Everyone keeps saying eventually we'll get specialists' notes. I'm in a primary care also, so let me get the specialists' notes and ER notes. They're saying once everyone's connected themselves, then it will be interconnected, so it increases my interest because I know eventually it will happen. But it only leads to frustration now because it's not being done.

So we're not talking to each other right now, and the question that I have is, when would we be able to do that? That would be important for us. For me, the benefit is having that ability to actually talk to each other. That would be the great benefit.

Right now, if you're using an EHR, you can't get anything from specialists. You really can't get anything from anyone. It seems that even the pharmacies aren't set up properly to receive electronic prescriptions. Many times the patient is calling you. Why isn't it at the pharmacy—you resend the prescription 4 times and you still have to send it again. It would be nice to have people in the state of readiness, meaning pharmacies, hospitals, private offices, clinics...then you all phase in everyone all at the same time. I think these different levels of phase-in creates a lot of problems.

It's my understanding that the interface makes it difficult to communicate. Some are written in HL7 language while the data in some systems are coded in a different interface. [The issue is] getting those computers to communicate with one another. We have a fax server so we can fax through a fax server directly from our records to a clinic or to a facility—so we're not having to print and then fax. It faxes from the software, so that's been helpful, since you don't have to print but it's not an electronic interface.

EHR adopters discussed the some of the challenges to care coordination that they have encountered because the EHR they use is not interoperable. Most participants agreed that interoperability will improve care ultimately.

I think if it were implemented the way we all ideologically think it should be implemented [it would be great]. In other words, I took my child here and then I went to a specialist—the records are immediately available to this physician, and all of the lab work and all of the justification and so on is all there. Then I think there's certainly some money to be saved and I think the standard of care will be improved. Just implementing an EHR will not solve the problem because it's not universally available to other people. Right now I have a primary care doctor. I have a gynecologist. I have a urologist. And none of them talk to each other or share any records, and so, you know, I need some bladder suspension surgery, I get a CBC and a Chem 7. Next week I need an annual physical, and they order all the same things again. And then, I suppose the only other hard thing is that they don't communicate to each other. So if I see a newborn at one site and I'm doing all this stuff, I have to fax paper notes to my site that then have to be extracted into our her system. It would be nice if there were ways to make them communicate. No, we don't do that at all [share information electronically]. Even in our own hospital we have visiting nurses and we can't share our records with the visiting nurses—they have a completely different medical record setup, which is absurd because we are under the same organization. The ER has its own system and we can't share with the ER either—it makes absolutely no sense to me. To get EKGs or stuff from the ER would be hugely helpful. They could notify us that our patients are there and we could put in orders to the visiting nurses and access their records to see how their blood pressure is doing. That would be a huge help but right now we can't do that.

Some participants discussed the additional costs that they will incur or expect they will incur when interoperability becomes a reality.

It would be so helpful for the hospitals to be able to communicate with us [the providers]. The bad news is that people say you need to get a portal and—Medicaid patients and portals—I am wondering if that is going to be helpful. We started the beginning process of looking into portals so patients and specialists could access the information and the hospitals could access the information like a shared data pool. Our vendor says it is \$20,000 to set up that bridge and \$60 per provider per month. We have other quotes that range down to \$2,000 for the bridge and half the price per provider per month. I am going to echo and say everybody has their hand out. It seems like we are doing things a little bit backwards. Eventually MU means there is going to be this ability to communicate with other providers but the language should be written for the computer initially...We are going to have all these systems and money invested and at the end they are going to say, now you need to communicate with each other so how are you going to do that? The vendors will do it but they will charge us incredible amounts of money to make everything [interoperable] because it seems like a really difficult task. It's a downfall too, of this program—you are spending so much money on an EHR and everybody has different programs and no one talks to each other at the present time. It is a really dumb situation in a sense.

## Upgrading EHRs: Common Challenges

Only a few EHR adopters participating in this study mentioned that they had changed to a *certified* EHR that would qualify them for the Medicaid EHR Incentive Program. Only providers in private practice mentioned this concern (no health center employees reported it as an issue.) The majority of adopters had transitioned from paper records only to an EHR. Of those that reported having transitioned from one EHR to another—either because of the EHR Incentive Program or for other reasons—more reported that the transition process was difficult than easy. The challenges in switching EHRs or vendors include—

- Not being able to migrate data from one system to another;
- Using two systems in parallel until all data are migrated into new system;
- Retraining staff; and
- Learning a new system.

We used to have different electronic health records but that has become dormant. There was no update for [our initial EHR vendor] so that's why we ended up using [our new EHR vendor] because they're different...if you're asking for challenges, I haven't had any trouble.

We just switched to [EHR vendor] and nothing is going to transfer over from the previous system so everything will have to be manually entered again on each patient.

It was a difficult transition because there were so many things in the new system that didn't make sense compared to the old system and... you couldn't scan in a lot of documents. A lot of problem lists had to be typed in again. It was a lot of work. So just making the transition from one EHR to another was pretty horrible, actually. We started the transition 3 years ago and even now I have patients come in whose records are still in the old system, and I have to print out their records from the old system and put in a new problem list in the new system. It's just like having a new patient. So the transition is still going on a bit, but for the most part, it's over. It took about a year and a half to fully implement.

## Achieving Meaningful Use: Common Processes and Barriers

This section describes the frequency with which EHR adopters reported using or not using a variety of EHR functions, and provides representative comments regarding their satisfaction with the function or common barriers they faced in using a function. The EHR functions are organized according to whether they are part of the Stage 1 MU core set or Stage 1 menu set objectives. The implications of these comments for achieving MU in Stage 2 are discussed in Chapter 4.

### EHR Functions: Stage 1 Core Set Objectives

**Record patient demographics (sex, race, ethnicity, date of birth, preferred language) as structured data.** Nearly all EHR adopters reported using this function. Some particular challenges reported in doing this consistently included—

- Needing to enter preferred language using a different screen than race and ethnicity;
- Not having an appropriate set of options for ethnicity (and therefore reporting “other” quite frequently); and
- More time to document.

**Record vital signs and chart changes (height, weight, blood pressure, body-mass index, growth charts for children) as structured data (patients 2 years or older).** A majority of participants indicated that they used their EHRs to produce growth charts for children and found them very helpful. The most frequently reported challenge in recording vital signs was by pediatricians who did not think that blood pressure readings were clinically appropriate at age 2, and noted that clinical guidelines from the American Academy of Pediatrics do not call for taking blood pressures until age 3.

So the growth chart is actually a time saver, and you don't have to look for the piece of paper in the paper chart. The fact that you can see all the vital signs in records of previous visits in the structured data is very, very valuable.

**Problem lists of current and active diagnoses.** A majority of EHR adopters reported using their EHRs to maintain problem lists, but none had positive comments about how this function

impacted their clinical care. On the contrary, a few participants reported challenges with using this function because of how and where a particular EHR documents problem lists, or because the structured nature of the problem list can mask the importance of a problem in understanding the patient's medical history.

You have to drop your alcoholic to 8[th] or 9[th] [on the problem list]...when the patient comes for a vaccine or for a sore throat or for a sinusitis...it's very friendly and it's very good. The only problem is for the complicated patients.

**Active medication list.** A majority of EHR adopters reported using their EHRs to maintain active medication lists. Several participants mentioned that this is or would be a useful function, while others noted some challenges with using this function effectively. For example, one participant noted that their EHR did not provide an option for indicating when a patient stopped taking a medication. Pediatricians in particular frequently mentioned another concern: they found it difficult to update the medication list with over-the-counter medications that would not automatically populate the list when electronically prescribed.

You know, when we're talking about medication, if I put on my medication list that the patient is on Flintstone chewables, but I haven't prescribed it, you know, apparently you don't get credit for that.

**Active medication allergy list.** A majority of EHR adopters reported using their EHRs to maintain active medication allergy lists. A few participants felt that their EHR did not accommodate clinically relevant information, but no major challenges were reported with using this function.

Medication allergy lists—I'm not thrilled with because they're too definitive. For instance, the patient will say they have a sulfa allergy. I don't have a way of putting a sulfa drug category in there. I have to pick a known drug. I don't know which of the sulfa drugs [are a problem]. I make the assumption that we should be worried about all the sulfa drugs. So that's kind of a pain.

When they [the REC] first did the scorecard with me, they said I was 20 percent compliant with the allergies, and I knew that that was not true...In other words, you didn't get any credit for anything that was not structured. It either had to be a structured allergy, or you had to check the box "no known drug allergies." So, I thought that that was a limitation of the system, because you're asking more than just about drug allergies...Suppose the child is peanut allergic; that becomes an issue. So those all have to be under structured data. So I created additional items on the structured list, and one of the things I put on the structured list was no known allergies, which means more than just drug; it covers other allergies as well. So now I do that on all the patients that have no allergies, and the last score card was better in terms of the percent, the people who were asked about allergies. But I thought it was a limitation of the system. Because there's more to life than whether you're allergic to a drug or not.

**Record smoking status as structured data (patients 13 years or older).** A majority of EHR adopters reported using their EHRs to record patients' smoking status. Several participants made positive comments about how easy it was to do this in the EHR, with one participant noting that the EHR could record additional detail on number of cigarettes per day smoked (if applicable), so the office could track progress on smoking cessation efforts.

Pediatricians more frequently reported that this objective did not apply to them. Other participants noted that updating this status on every visit was a challenge, and it was often not relevant to the acute reason for the office visit. This may represent a misunderstanding of the MU measure.

**Provide clinical summaries within 3 business days.** EHR adopters participating in these focus groups were evenly split between those who provide summaries within this timeline and

those who do not. Adopters who found this feature helpful were most likely to cite the benefit in providing information to patients who were going from their office to the hospital or another practice. Several participants noted that patients found the clinical summaries helpful, and one participant noted that it was useful to him to receive a clinical summary from a patient's visit to another provider.

Participants noted significant barriers to providing clinical summaries to patients, including—

- Pressure to complete charting while the patient was still in the office;
- For pediatricians, whether to give the clinical summary to the parent as well as the child (or at what age the clinical summary would violate an adolescent's confidentiality);
- Printouts of the clinical summary are not generated near the exam room, so the patient rarely picks them up;
- Clinical summaries are in English, which does not help a non-English-speaking population; and
- Patients tend to dispose of them quickly (e.g., just inside or outside the office) and do not seem interested.

At the end of their visit patients love to get a list of their medications with their updates in it and any significant steps that you plan for them to do for their diabetes or other condition. The printout also says when their next visit is due if it's a well-child check. The patients really like the clinical summary printed out and handed to them. We're just starting it, mostly because MU requires it, but it's good.

I usually show them a preview of everything and if they say they would like to keep a copy, they get a copy. If they don't want it, I don't give it to them. For all elderly patients about 65 to 70, who have trouble with memory, I have always given them a summary so that's no different. I give it to them regardless.

I would like to use the after-visit summary, but I don't usually have my chart notes finished by the time they're leaving and it prints way on the other side of the clinic; I haven't been able to fix that function.

We can print that and give it to them but we are supposed to print after every single visit if we don't have patient portal. That's a lot of wasted paper. We print growth charts for everybody. Most of the time we see them in the garbage pile going outside.

**Provide electronic copy of health information on request.** By a slight margin, more EHR adopters participating in the focus groups reported that they do not use this function than those who said that they do. None of the participants noted this feature as helpful; instead, a few participants noted the challenges with meeting this Stage 1 MU objective, such as cost of electronic media.

Making a copy of the patient's health information available—where does that fall in charging for records? Right now paper copying costs us a fair amount of money and if we participate with certain providers and certain insurance companies, we can't charge anybody for it. Now, if we have to absorb even an inexpensive thumb drive or stack of CDs when we are seeing patients who have \$3 copays, that is one more cost for us to absorb.

If you don't have patient portal...you can do a thumb drive (very expensive) or write a CD, which I'm thinking of doing for anybody who requests information. The third option is to send them an e-mail. The problem with e-mail is you have to encrypt it and you have to send two e-mails. The first e-mail has the actual electronic data that is encrypted and the second e-mail has the software to unzip it and also give a password. I don't know how many people will be able to do that. So that is a challenge.

I do have the capability and if patients request it, I do give it, but hardly any patient ever wants it; maybe four or five patients have asked for it so far in the last 6 months.

**Transmit prescriptions electronically.** Nearly all EHR adopters who participated in the focus groups noted they used the electronic prescribing feature often, and many found the ability to send electronic prescriptions helpful and easy. Several nonadopters highlighted this function as one they would like to use. However, even when providers reported the usefulness of this function, they also noted challenges with it, often because pharmacies did not receive the electronic prescription. A few providers noted that they prescribe many controlled substances that would not be supported by e-prescribing. Another provider noted that he was the only physician in his office and, therefore, the only one who could e-prescribe, which increased his workload.

I think if the provider's office can do it, it would be easier for the patients. Then they don't have to worry about losing their prescription or misplacing it and we could have direct contact with the pharmacies so if there needs to be adjustment or change, we could talk to each other directly and bypass the patient. A lot of times the patient is at the pharmacy and it says it was sent and received but it is not there. The pharmacy checks it every hour on the hour, so it may fall through the cracks. It is a logistical nightmare and the [prescriptions] seem to end up in a black hole somewhere. The patient calls a day or two later; he/she has not received the prescription, and so we have decided not to participate until we can find a better system or a better way to do it in our current system.

**Computer provider order entry for medication orders.** Most EHR adopters who participated in these focus groups reported using their EHR to submit medication orders (prescriptions.) One dentist noted that this Stage 1 MU objective was not relevant to her practice.

**Drug-drug and drug-allergy checks.** Most EHR adopters reported using this function in their EHRs, and several nonadopters noted this as a desirable feature in an EHR. Several providers noted that they still would or do rely on pharmacists to do this. Two EHR adopters noted that they received too many alerts from their system to be helpful.

My system pulls up the long list of drug interactions for almost 100 percent of medications—either mild or moderate or severe. It's exhausting, draining, to a point where sometimes it's futile...It's every drug that the patient is on, every drug is showing some degree of interaction. You just cannot read. So it negates the whole purpose of drug interaction checks.

Checking the drug interactions is ridiculous because it comes up on almost every third or second prescription. I've gotten to where I almost ignore that, and I hate to say that but I do because there are too many of them to read.

**Implement one clinical decision support rule.** Focus group participants were familiar with using their EHR for drug-drug and drug-allergy checks, but when asked about the Stage 1 MU objective to implement a clinical decision support rule more generally, more EHR adopters reported that they had not done this or were unsure of having done this, usually due to confusion over what the term “clinical decision support” meant. A few participants noted that they found the alerts built into their EHR to be a very helpful and positive feature. Others noted their dislike of alerts that were not relevant to the care they were providing at the time. However, more participants seemed unaware of the ability of their EHR to provide these types of tools.

Among nonadopters, several commented that they would find this feature useful, while a few others were concerned that it represented “cookbook” medicine.



You know, I totally agree with them, the alert system is excellent; it gives us a good idea what we have—what we should look for. Each time a patient comes, we can look up the old labs. It's much easier rather than going through the charts (and there's a missing page and you can't find it by turning pages) so this is more efficient and very easy to follow. It's easy to keep a better health record of the patient when we have this electronic system.

There are reminders for patients for preventive and followup care, but we use a program called [EHR vendor] and it's not intuitive. They have something called [acronym] or [acronym]. I don't even know what it stands for. But they aren't...reminders for when we need to do things, if somebody's due for a mammogram or colonoscopy.

What do you mean by clinical decision support?

I probably do not use that as much as I ought to use that. We do have alerts. Sometimes they don't really apply to the patient I'm seeing.

I figure it would be better if there was more reliable clinical decision within the EHR system, but I haven't seen that as a model yet.

**Report clinical quality measures to CMS or States.** A majority of EHR adopters reported that their EHR can generate clinical quality measure reports. One participant noted the benefit of being able to measure quality without the tedious job of looking through charts. Another participant from an FQHC reported that her IT department pulls these reports.

The concerns expressed related to this Stage 1 MU objective varied. One provider who does a majority of prenatal visits did not feel there were measures related to her practice. Several other providers noted concerns about the validity of the data used to calculate clinical quality measures, since they had first-hand experience with the difficulties of finding the right places in the EHRs in which to document clinical information using structured data fields.

Clinical quality measures—very cumbersome. We can do it through our EMR—very complex but we can do it through our EMR, pull the data, but it's a lot of hard work and plugging in a lot of extra codes to say that we've done it or we checked it. For example, for blood pressure above 90 there's a separate code; below 90 there's a separate code. So it's a lot of hard work but we can do it.

[Question: Do you use your EHR to generate reports for clinical quality measures?] I am not even familiar with that.

## EHR functions: Stage 1 Menu Set Objectives

**Implement drug formulary checks, access to at least one formulary.** More EHR adopters responded that they did not use this function than those who reported using it. A few participants noted its usefulness, but more noted the difficulty of using the function when their patient population was covered by many different insurers, not all of whom made a formulary available through an EHR. Others noted that the formularies within their EHRs did not always contain accurate information, so they did not trust them to guide their decisionmaking in prescribing drugs, or that the formularies took too long to load in their system to be useful. Several participants noted the use of alternative tools, such as Epocrates, outside of their EHR.

When it works it's helpful.

That's an add-on for our software as well. We have not purchased it and...from what they tell us, when you put in all the formularies you might serve, the software slows down so much that you might be waiting in the prescribing segment of your chart for a minute or two while it loads all these formularies. So we haven't purchased that add-on yet. For the most part we all use Epocrates.

Drug formulary—it is ironic that we have the ability to do this, but we click no, because it takes too long to watch the system check. It takes a minute but it seems like forever so we just blow right past it.

**Incorporate lab test results into EHRs as structured data.** As reported above, the most frequently reported electronic interface that EHR adopters had was with laboratories. Some participants who had this functionality reported the usefulness in receiving laboratory results more quickly, or being able to make the results available to patients through an online patient portal. However, many providers noted the expense of creating those interfaces so that laboratory results could be incorporated into EHRs as structured data. Although they would like an electronic interface, they would still need to enter information from paper or scanned records in order to put results in a structured format.

Well, I think it makes it easier, and it shortens the waiting time, because we can get the lab results in 2 or 3 days whereas before it could take 5 to 7 days for us to get the results.

If it would pull data into the system automatically, that would be lovely. We have the same difficulty right now. If I send a patient out to [lab vendor], I may or may not get a piece of paper back from [lab vendor] saying whatever that lab result is. And I have no way to import that electronically into the system so it's available to us, it just becomes part of the paper record. So right now, if I want that, it gets scanned and then added to the encounter, but it's cumbersome and ugly.

Basically in our system I can do pretty much all the structured data that's listed except for the last one, which is lab test results. The reason, of course, is that we're not directly linked to our labs. Whether it's in the hospital or not, we send out the request diagnostics because it's too expensive to try to have an interface with each entity. So basically we're getting results faxed in and then we scan them into the EMR system. If I want to put in the results of the labs as structured data, it is going to create a lot more work.

**Generate lists of patients by specific conditions.** Many more EHR adopters reported the that they could generate lists of patients by specific conditions, than those who said their EHR could not. Several participants cited specific examples of how they used this function. One tracked patients with asthma, diabetes, or BMI over the 90<sup>th</sup> percentile. Another example was to query the EHR on specific diagnoses or age ranges. A third example was using this function to be able to report on how often specific care was provided to a patient population.

Participants in several focus groups noted challenges with using this function. For example, a few participants noted that it was difficult to get information they had entered into the EHR generated from the EHR in report formats. Others noted that they used the billing system, not the EHR, to generate these lists for quality improvement.

**Identify patient-specific education resources from EHR.** By a slight margin, more EHR adopters said that they used their EHR to identify patient-specific education resources than those who said they did not use their EHR this way. Only one participant reported satisfaction with their EHR's functionality. Others highlighted challenges to using this function, such as not finding information on a sufficient number of topics, or information in the right language to use with the patient. An additional concern was the cost associated with subscribing to a service that provided high-quality patient education resources. Many more participants indicated that they provided patient-specific education resources, but went to the following sources to find the appropriate information:

- Google™
- FamilyDoctor.org (information in both English and Spanish)
- Other unspecified Web sites
- American Academy of Pediatrics fact sheets
- Brochure from pharmaceutical company

**Medication reconciliation performed at transition of care.** Participants who used EHRs were about evenly divided between those who performed medication reconciliation and those who did not. Only one participant said that this function was not a problem, and that she was able to do this when a patient transferred from a hospital or nursing home. Participants more frequently reported that any medication reconciliation they do is manual, not automatic because information they receive from other providers is mostly paper-based. Several participants noted that they weren't sure what they needed to do to meet the Stage 1 MU objective, even though one said she received an alert from her EHR prompting her to do this.

**Summary of care record for patient transitions or referrals.** Slightly more EHR adopters reported being able to produce a summary of care record from their EHR than those reporting they could not do it. One participant noted that the benefit was that the records were legible and neatly typed. Several participants were unsure of the requirements for this Stage 1 MU objective and whether or not their EHR could meet those requirements.

**Test ability to submit immunization or syndromic surveillance data to registries or public health agencies.** Many more EHR adopters reported that they did not use their EHR for public health reporting than those who said they could use their EHR this way, with a small number of people indicating they were unsure of their system's capabilities. None of the participants recognized the ability of their public health agency to receive, or their EHR to submit, syndromic surveillance data. More EHR adopters spoke positively about their State's immunization registry, whether or not they could electronically upload data from their EHR to the immunization registry.

Some nonadopters said they would like to use this function, while others believed that EHRs did not yet have this capability and were skeptical that it would become available in the near term.

They can access immunization information. Actually, at midnight our immunization documentation gets uploaded to the State registry. We have an interface with them, which makes reporting easier. The [State] Department of Health doesn't have the bidirectional interface set up yet. That's the only reason I'm not able to use it through my EMR.

**Send reminders for preventive or followup care (patients 65 or older or 5 years or younger).** More EHR adopters reported that they did not use their EHR to send reminders than those who reported that they did. Participants most frequently commented that they send reminders manually (not from their EHR) because their EHR is "clunky" in the way it sends reminders. One participant noted that patients were reluctant to share email addresses that would facilitate these types of reminders generated from the EHR.

A lot of patients—they are saying, on the HIPAA [form], not to contact me by e-mail...in terms of the way that I can communicate to them and communicate their information. Some are saying I don't want e-mail. I don't want fax. I don't think my program has any way to do that, and I have not come upon a good system to do that automatically.

**Provide patients with timely electronic access to their health information.** Many more EHR adopters reported that they did not have the ability to provide patients with online access to their health information via a patient portal or PHR. Among those that did have a way of providing patients with online access to their health information, several participants noted that this feature was beneficial to both providers and patients.

However, participants (most of whom did not currently have a patient portal) also reported concerns with setting up online access to health information for their patients, including—

- Cost
- Concern about confidentiality and security of information
- Language barriers

Patients are very happy with it. We try to teach patients that the portal is there for them to look at that information and help us to make any corrections, any errors they find. It has been very well accepted by the patients and they actually love the portal.

Patient access to their own records online—no, we don't have a patient portal yet but we want one. It's probably like a million dollars to set it up for our system. So it's very expensive to do that.

We have patients that still don't speak English, mostly the mothers who I'm dealing with. Their husbands may speak English, but the mothers don't. And I just don't seem to them logging into the patient portal, and filling out forms in advance, and checking on their own lab results. So I think the [State Medicaid] clientele that I'm working with are not going to be using it.

There are all the issues—for the patient portal I mentioned, you have to get a password and you have to give an ID. When they go home, they usually have problem accessing so they have to call the office and change their passwords and change the ID. It's a headache.

## Cross-Cutting Issues

### Regional Extension Centers

A majority of participants had not heard of the Regional Extension Centers (RECs). There was also some confusion over what organization might be the REC in a given State. For example, one respondent erroneously thought that a Regional Health Information Organization in her State was the REC. When the RECs were described, participants responded positively to the concept with comments such as “As far as we know, we don't have a Regional Extension Center in our area but I would like one,” but questioned why the RECs had not publicized their services.

It would be nice if these RECs would make their services known, because I had no idea that they were out there.

Never heard of them. It is interesting because there is no shortage of information to let you know the penalty if you don't put in the system, but this is the first time I have ever heard about the [RECs].

Are these RECs for the implementation of EHRs and to help with adoption? What does the government require of them to announce themselves to people who need them?

Although a minority of participants had worked with an REC, they reported very positive experiences. (Only one respondent had heard of an REC but not worked with them.) RECs had provided assistance in understanding the EHR Incentive Program, selecting hardware and software, implementation, additional onsite training (beyond what vendors offered), and supporting providers in communicating with their vendors. During several focus groups, participants requested information from others on the call who had worked with an REC or

remarked that they had just searched for information on the REC and would be contacting them after the focus group. Examples of comments from participants include—

...they're actually more helpful than anyone else.  
...it wasn't until we had [the REC] step in that they...showed me how I could actually qualify for MU with Medicaid...We implemented the program last year and they were helpful every step of the way.  
It's been really, really helpful. I think it would have been very difficult without him.  
Onsite training is always more valuable than either like a chat, like an online chat or on the phone. And many of these companies are never going to be located in the State you're in and many times you're dealing with time, time zone differences, language barriers. Sometimes it's tough to get the training over the phone. It's nice to have somebody look over your shoulder. Our REC rep didn't help me choose the EMR, but certainly put a blessing on it and she reassured me, "you're really going to like it."

## Variety of Professionals Eligible for Incentive Program

One of the key features specific to the Medicaid EHR Incentive Program is that it applies to many different types of providers, most of whom are represented in this study. Our main finding is that all types of providers cited very similar barriers to using EHRs for MU; however, there were some notable differences for dentists, pediatricians, and midwives.

Dentists mentioned the lack of certified EHR products. Although many dental EHRs are available, few are certified by an ONC-Authorized Testing and Certification Body. Dentists also noted that help was not available to them.

There's nobody out there that's certified within the industry for dentists. So you're pretty much on your own.  
I've done quite a bit of research and there's no one out there that can help in the dental profession at all.

In addition to challenges in finding a certified EHR that meets dental needs, participants also mentioned that not all of the MU objectives, such as those related to immunizations, were relevant to dentists.

Pediatricians, obstetricians, gynecologists, and nurse midwives find some objectives irrelevant to their practice. Children generally have far fewer lab tests, medications, and chronic conditions than adult patients. Pediatricians also noted that taking blood pressures in 2-year olds was challenging to do and not in alignment with recommendations from the American Academy of Pediatrics, which recommends taking blood pressure starting at age 3. Some types of structured data, such as medication doses and weights, were not appropriate for pediatric patients. Some EHRs only allow weights to be recorded in pounds and do not allow for ounces, which is an important degree of accuracy for infants, particularly premature infants.

We [pediatrics] don't have as many lab tests as adult medicine.  
I have a big issue with blood pressures in children 2 years old. They require 2 years and older to take blood pressures and it's very difficult to take a blood pressure in a 2-year-old. Actually, the American Academy of Pediatrics requires blood pressuring children older than 3. So right now, we are, right at the 50 percent there, like in 49 something. Sometimes we have to take blood pressures just to try to increase the percentage of blood pressures taken, but not because it is critically necessary at that point.  
One thing I don't like is that, for example, when you enter the weight for a child, it has the weight in pounds; it doesn't have ounces. That makes a huge difference for a newborn or a small infant, so we try to get around that sometime by writing, for example, 5 lbs and 5 over 16 pounds because they don't have ounces.

## Chapter 4. Discussion and Conclusions

Focus groups with participants from around the country yielded rich information on the influence of the Medicaid EHR Incentive Program to promote (or influence) the adoption and use of EHRs in specific ways. The following sections synthesize the findings presented above in terms of the barriers to achieving MU among Medicaid providers of EHRs.

### Barriers to Meaningful Use in Medicaid

#### Barriers Specific to Medicaid Providers

As noted previously, some—but not all—prior research suggests that providers who serve a high proportion of Medicaid-insured patients may be at higher risk for not adopting or using comprehensive EHRs. This study explores several potential factors that could explain those prior findings. It also examines whether specific features of the Medicaid EHR Incentive Program pose specific barriers to Medicaid providers in accessing those potential incentive payments.

First, the study examined whether characteristics of the Medicaid population make a difference in how providers use EHRs. In general, the reported barriers to adoption and MU of EHRs were not associated with serving a predominately Medicaid-insured population, and were consistent with barriers that have been previously reported in other studies of health care professionals. Aspects of the patient population, such as language spoken or complexity of health care needs, were seen as characteristics of the broader population at large and not specific to Medicaid. Several providers stated that there were few differences between the Medicaid population and their commercial population, and participants observed that many patients cycle on and off Medicaid with their changing employment status.

However, participants suggested two differences between Medicaid patients and other patients that are relevant to MU objectives:

1. Medicaid patients change addresses and contact information more frequently, which impacts the ability to send reminders, and
2. Medicaid patients have less reliable access to the Internet for the use of a patient portal (e.g., for obtaining electronic access to their health information or receiving email reminders).

In fact, any barriers to adopting and using EHRs that could be associated with Medicaid providers were issues specific to dentists, pediatricians, and other provider types who are eligible for the Medicaid EHR Incentive Program. Pediatricians are specifically concerned about whether computer equipment could be left in an exam room where small children were waiting, or whether adolescents should have sole access to their electronic health information.

Second, although several studies have indicated that interest in the Medicaid EHR Incentive Program would be high, one barrier that emerged from the focus groups is the lack of reliable information Medicaid providers feel they receive from their State programs, despite a desire to hear about the program directly from a government source rather than a vendor. Participants also expressed some mistrust about whether the incentive payments would materialize, given the history of reimbursement changes that some providers had experienced in their State.

Third, one of the research questions for this study was whether there were barriers to participating in the Medicaid EHR Incentive Program due to difficulty in determining eligibility. Another research question related to the knowledge that providers had about the requirement to use certified EHR technology to qualify for the program. In fact, this study found that determining eligibility for the Medicaid EHR Incentive Program did not pose barriers to providers who would otherwise be interested in using EHRs because of the Medicaid EHR Incentive Program. Similarly, this study did not find confusion as to whether or not EHRs were certified, although in some cases participants misunderstood what certification means.

Fourth, adopters and nonadopters alike mentioned the cost of EHRs and potential loss of productivity as their top concerns. Some participants commented about cost in the context of declining Medicaid reimbursement for clinical services due to State budgeting concerns, but most providers did not cite the patient population they served as the key reason for their concern about cost. Instead, this finding could be seen as consistent with many other studies conducted in which physicians cited cost as the main barrier to EHR adoption.<sup>6, 13, 20, 21</sup>

Fifth, this study explored whether barriers to MU might vary by type of practitioner, especially because nurse practitioners, certified nurse midwives, dentists, and pediatricians can qualify for the Medicaid EHR Incentive Program but not the Medicare EHR Incentive Program. This study finds that there are different barriers for pediatricians and dentists, usually having to do with functionality of existing certified EHRs, but that physicians, nurse practitioners, and physician assistants all have similar challenges with using EHRs. Due to the ultimate composition of the focus groups, this study is not able to draw conclusive findings about any differences in barriers to achieving MU among providers who work in CHCs, or among certified nurse midwives.

## **Implications for Medicaid Providers' Achievement of Stage 1 Objectives**

Some providers reported that they had already filed for and received their first installment under the Medicaid EHR Incentive Program for adoption/implementation/upgrade. Many adopters referred to work they were doing—with the help of their management team or an REC—to track their progress towards meeting the Stage 1 MU objectives, and noted that they were motivated by the idea of receiving additional incentive payments once they became a Meaningful User as defined by Stage 1 MU objectives.

However, still others noted the struggle they had with using their EHRs to perform the functions that would qualify them for MU, although they were aware of the MU objectives and were often striving towards meeting the goals for MU set forth in regulation. The challenges to using EHRs that providers reported in this study were consistent with challenges to using EHRs reported in other research studies that were not specific to providers who cared for a high proportion of Medicaid beneficiaries. The most significant concerns were the additional time needed to use EHRs, the perceived need to create workarounds to accommodate difficulty with some aspects of EHR usability, and the negative impact EHRs can have on patient-provider interactions; the latter two findings are also commonly reported in the literature.

Other than the positive experience that some providers reported with the help they received from their REC, lack of access to technical assistance was a frequently reported concern by focus group participants. In fact, prior research indicates that satisfaction and ease of use of an EHR increases with increased training.<sup>16</sup>

Perhaps due to lack of training on a specific EHR or general technical assistance on transitioning from paper to EHRs, a significant number of participants in this study were still not using their EHR for certain MU objectives. Providers must meet 15 core objectives and choose five of 10 menu set objectives to qualify for MU. However, approximately half of participants were not routinely using three core set objectives (clinical decision support, providing electronic copy of health information on request, and providing clinical summaries of the office visit.) Similarly, a majority reported they were not using six menu set objectives: (1) implementing a drug formulary check system, (2) incorporating laboratory test results into EHRs as structured data, (3) using the EHRs to provide patient-specific educational resources, (4) performing medication reconciliation at transitions in care, (5) sending patient reminders, and (6) providing patients with timely electronic access to their health information.

Combined with widespread dissatisfaction with training and support from EHR vendors, and uneven reports of access to other sources of technical assistance in using EHRs, the process in which Medicaid providers achieve Stage 1 MU may take longer than 1 year, if it is achievable at all within providers' current working environment. Providers from larger practices or FQHCs that have a more developed infrastructure in which to train internal staff and monitor their progress in using EHRs may achieve Stage 1 MU objectives more readily, but others may lag unless they receive additional supports.

## **Implications for Stage 2 Meaningful Use Objectives**

The Notice of Proposed Rule Making that outlines proposed changes to the Medicare and Medicaid EHR Incentive Programs, namely by identifying proposed Stage 2 MU objectives and changes to Stage 1 MU objectives, was undergoing public comment through May 7, 2012. However, the findings of this study suggest some potential implications for Medicaid providers if any elements of the proposed rule are adopted as-is in the final rule.

**Demand for health information exchange.** Medicaid providers in this study report high use of EHR functions such as maintaining active medication lists, maintaining active allergy lists, and maintaining active problem lists. In Stage 2 MU, these EHR functions are proposed to be measured together as part of the core set objective measuring whether an EHR can produce a summary of care document for more than 65 percent of transitions of care, with at least 10 percent of these documents sent electronically between two providers using different EHR vendors. Based on the large number of comments citing frustration with the lack of interoperability between systems, this proposed MU objective may be more valuable to Medicaid providers, thereby creating an additional motivation to meet MU objectives in Stage 2. However, the technology must be available to support such exchange.

**Use of structured data.** Raising the threshold for the number of patients whose clinical information is recorded as structured data, from over 50 percent to (proposed) over 80 percent, would likely not pose a barrier to Medicaid providers who are already using the structured data fields in their EHRs (and most are.) This objective may pose more of a challenge for EHR adopters who are slower to transition patient records from paper-based to electronic, or who are maintaining two electronic systems due to problems in migrating data from one to another.

**Change in age range for recording vital signs.** Several comments made by pediatricians in this study noted the difficulty and/or lack of clinical significance in taking blood pressure readings from children as young as 2 years old. The proposed change in the age range to which this requirement would apply—to age 3 and older—would likely be welcomed by pediatricians who qualify for the Medicaid EHR Incentive Program.



**Transmitting immunization data to public health agencies.** Most of the providers in this study expressed a willingness and interest to have bidirectional access to their State’s immunization registry. Ongoing transmission of immunization data to public health agencies is a proposed Stage 2 MU core set objective, although this exchange would be unidirectional and is contingent on the State systems’ ability to accept the data electronically. CMS has noted that Stage 3 will likely include bidirectional exchange.

**Clinical decision support rules.** Another proposed Stage 2 core set objective is to have at least five clinical decision support rules implemented (an increase from one clinical decision support rule), in addition to drug-drug and drug-allergy checks. According to the findings of this study, this objective may prove a barrier to meeting Stage 2 MU objectives unless vendors and others make a greater effort to indicate what the possible clinical decision support rules are and how they can be implemented.

**High cost of implementing some EHR functions.** In the proposed rule, some objectives have moved from the Stage 1 menu set objectives to the core set. In particular, these proposed objectives include the ability to incorporate more than 55 percent of laboratory test results as structured data in the EHR, and the ability to provide patients with online access with more than 10 percent actually accessing online health information. In addition to concerns about the ongoing costs of maintaining EHRs—which were frequently mentioned by Medicaid providers in this study—providers noted the significant barrier posed by the amount EHR vendors and others are charging to set up electronic interfaces to enable receipt of laboratory tests electronically or to set up patient access to information in a provider’s EHR.

## **Additional Challenges and Opportunities**

In addition to the importance of this study in identifying barriers that Medicaid providers have in meeting specific Stage 1 and proposed Stage 2 MU objectives, the findings of this study point to other factors that could impede Medicaid providers’ progress towards achieving MU of their EHRs—including concerns about EHR selection; implementation and workflow issues; and availability of technical assistance.

## **Implications for Technical Assistance to Medicaid Providers**

**RECs.** The RECs appear to be an underpublicized and underutilized resource. The majority of participants were not aware of the RECs, although several expressed interest in learning more after hearing the RECs described. Participants who had worked with an REC were overwhelmingly positive in their assessment. The lack of awareness about the RECs combined with the positive assessment of the RECs suggest that more can be done to publicize the services offered by the RECs.

RECs are intended to help with tasks where participants noted a need for assistance, including adoption, implementation, and ongoing technical assistance. The challenges noted by providers who have already adopted and implemented an EHR could be also mitigated by help from an REC, including issues related to workflow, best practices for documentation, and appropriately backing up data.

**EHR selection and transition.** Both adopters and nonadopters report needing help with assessing their system needs, their work flow, and in selecting an appropriate EHR. They expressed a need for an intuitive system that will be easy to use and easy to train others to use.

The needs assessment must include considerations of how the hardware as well and software will work for the practice. This includes ergonomic assessment, exam room configuration, and location of critical equipment such as proximity to the printer to give copies of patient summaries or information to patients.

Providers could also use specific information for how to transition from one system to another, including options for transferring data to the new system such as cloud-based options for storing data in transition.

Nonadopters' anticipated benefits conflict with adopters' reported experiences. Thus, more education regarding what to expect when adopting and implementing an EHR is needed for first-time adopters.

**Practice transformation and workflow.** The findings of this study suggest that CMS has defined certain EHR functions as demonstrating MU of EHRs, and yet operational and logistical challenges still exist for providers. The findings from this study suggest that there is an opportunity for both EHR vendors and other sources of technical assistance—like the RECs—to play an enhanced role in provider education and training.

For example, EHR vendors should shoulder the responsibility of improving the usability of some EHR functions, or providing vendor-specific training on how to optimize use of an EHR that would otherwise create barriers to providers' ability to meet MU objectives. Examples of these functions include implementing clinical decision support rules, performing medication reconciliation, providing patient-specific educational resources, and checking drug formularies.

Similarly, RECs might be ideally positioned to provide more general training on reorganizing office workflow, physical space, and patient team roles and responsibilities to help use EHR functions to meet certain MU objectives. These functions include providing patients with an electronic copy of their health information upon request, providing clinical summaries of the office visit, incorporating laboratory test results as structured data, and sending reminders about preventive and followup care.

A clear theme to emerge from this study is the widespread concern about the quality of clinical documentation entered into an EHR. While focus group participants recognized the potential for EHRs to enhance safety by increasing legibility of records and allowing structured data to support clinical decision support, they also sounded the alarm in terms of the amount of irrelevant or incorrect information they receive from other providers' EHRs. Participants often cited workarounds to help them maintain their productivity even while struggling to use an EHR, such as entering clinical notes into an EHR after the patient visit, or selecting a diagnosis code that is just approximate to the actual clinical diagnosis they would normally use. Additional training is necessary to address these potential safety risks that might be exacerbated by use of an EHR.

**Data management and storage.** Providers need more information on how to set up appropriate backup systems in case of loss of Internet, electricity, or a system crash. One clear barrier to completely embracing EHRs—to both nonadopters and adopters alike—is the concern that data will be lost and clinicians will either flounder during the patient visit or need to cancel patient visits (and therefore lose revenue.) Addressing this concern upfront could help many Medicaid providers better transition and adjust to using EHRs.

**Patient-provider engagement.** Adopters and nonadopters alike expressed concerns about the negative impact of EHRs on their relationship and communication with patients during the office visit. Until providers feel more comfortable about using EHRs in the presence of patients—so as to enable accurate and timely clinical documentation without feeling as though

they are missing key visual cues from the patient—they may be less interested in continuing their use of EHRs or adopting an EHR in the first place.

## **Opportunities for Health Information Exchange Services**

The cost of interfaces between laboratories, radiology, and EHRs suggest opportunity for local coordination. Only one participant mentioned the existence of his or her local Regional Health Information Organization. Others were frustrated at having to take on the burden of negotiating with each individual laboratory or radiology service to perform some of the EHR functions that would allow them to submit orders electronically and receive the results as structured data. There is a clear opportunity for health information exchange (HIE) services to play a role in facilitating achievement of MU, and for State HIE entities to reach out to Medicaid providers who may be most interested in creating electronic interfaces with other health care providers in the area.

## **Opportunities for EHR Functionality Enhancements**

Providers cited demand for free-hand drawing capability to enhance clinical documentation. A significant number of participants indicated that adoption of EHRs had diminished their ability to maintain accurate clinical documentation, especially if they were constrained by structured data fields and text description. None of the providers who participated in these focus groups indicated that they used an EHR that could accommodate this need. This complaint about EHRs represents both a market opportunity for EHRs and a policy opportunity for EHR-certifying bodies, should this be cited as a priority by more providers.

## Chapter 5. Actionable Recommendations

Based on the findings of this study, we have four overarching recommendations for Federal and State agencies who are looking to minimize barriers to adopting and using EHRs among Medicaid providers:

1. Promote opportunities for a more proactive approach by Medicaid agencies to facilitate the achievement of Meaningful Use (MU) among Medicaid providers;
2. Recommend more targeted, coordinated technical assistance for Stage 1 MU for Medicaid providers;
3. Promote planning for the Stage 2 MU requirements; and,
4. Create a short- and long-term research agenda that addresses many of the sociocultural, technical, and training/technical assistance needs of Medicaid providers that have been identified in this study.

### **Recommendation 1: Promote a more proactive approach by Medicaid agencies to assist Medicaid providers in achieving MU.**

The findings of this study suggest that Medicaid agencies can take a more active role to facilitate the achievement of MU among Medicaid providers, in these specific ways:

- Provide direct communication from State Medicaid agencies about the details of the Medicaid EHR Incentive Program. Medicaid providers have expressed an interest for more direct communication from State Medicaid agencies about the details of the Medicaid EHR Incentive Program. This communication would include: (a) specific direction as to what MU objectives are required; (b) what the process and timeline is for applying for incentive payments; and (c) what incentives, penalties, payment adjustments, or other Medicaid policies could affect providers who choose to use or not use EHRs.

Direct communication could occur through letters to providers from the Medicaid agency directly, so they are not mistaken for junk mail. Medicaid agencies could also leverage partnerships with State professional associations, their fiscal intermediaries, and other entities who have opportunities to communicate with providers at frequent intervals, to make sure a clear and consistent message about the Medicaid EHR Incentive Program reaches providers through more than one channel and at more than one time.

- Educate Medicaid providers about RECs and the technical assistance they can offer, as well as other existing resources from the Health Resources and Services Administration (HRSA) and the Agency for Healthcare Research and Quality (AHRQ). Medicaid agencies do not need to duplicate resources available, but could guide providers to resources that address some of the barriers and concerns identified in this report.

Because there are some States in which Medicaid providers are unaware of their REC, the Medicaid agency may assist in promoting the REC and its services to Medicaid providers specifically. Additionally, Medicaid agencies could share lists of providers who are likely eligible for the Medicaid EHR Incentive Program with the REC(s) in their States, so that the REC can advertise their services directly to those

providers. Some Medicaid agencies may choose to contract with RECs to provide assistance and services to providers who are eligible for the Medicaid EHR Incentive Program but are not considered to be part of the REC's initial target population of "priority" primary care providers (with 10 or fewer providers per practice.)

Other resources are also available: HRSA has developed toolkits on health IT adoption for safety net providers, rural providers, oral health providers, child health providers, critical access hospitals, and HIV/AIDS providers. They have also published a Network Guide that provides information on over 50 health center controlled networks (HCCNs), which have experience providing technical assistance to Medicaid providers on health IT adoption, quality improvement, and system redesign. Furthermore, HRSA continues to offer monthly Webinars related to EHR adoption and MU, which providers could view as archived broadcasts or attend live. All resources are available at <http://hrsa.gov/healthit/>

- Advocate to their State HIE entity the types of services that would be most worthwhile to Medicaid providers (and accelerate their achievement of MU), specifically in the area of creating electronic interfaces with laboratories and radiology facilities. By centralizing one place from which providers could access laboratory and radiology information, a State HIE could reduce the financial and time burden on Medicaid providers to negotiate an individual interface with each laboratory, radiology facility, or other provider type. Medicaid agencies who are working with their State HIE(s) could use the findings from this study to emphasize the strong demand for services that would allow for easier and more frequent health information exchange across different provider types and different EHRs.
- Promote the identification of both funding sources and innovative cost containment strategies to help reduce ongoing costs. Medicaid agencies could promote the Medicaid EHR Incentive Program along with other opportunities for Medicaid providers to cover the ongoing costs of maintaining EHRs, since the cost of EHRs (including security, upgrades, technical assistance, etc.) is a major concern for Medicaid providers as reported here.

**Recommendation 2: Provide more targeted, coordinated technical assistance tools, methods and processes for Stage 1 MU for Medicaid providers.**

Although some participants indicated that they have already successfully received one installment of Medicaid EHR Incentive Program payment under the adoption/implementation/upgrade standard, the results of this study demonstrate that many Medicaid providers fall short of being Meaningful Users of EHRs as defined in Stage 1. The following recommendations relate to specific actions that Medicaid agencies, RECs, vendors, and other entities involved in assisting Medicaid providers with EHR implementation and use can take to facilitate MU of EHRs. Some general education and technical assistance may be most appropriate for Medicaid agencies or RECs to deliver; in other cases, EHR vendors should take the lead to help train providers on specific EHR uses.

- Provide education—Medicaid agencies and RECs could provide education on the EHR certification process and provide guidance and assistance in EHR selection and acquisition. Medicaid providers in this study have indicated an assumption that EHR certification by ONC-approved bodies is a "seal of approval," while some have expressed disappointment that their EHRs—even the certified systems—are difficult

for them to use to achieve MU objectives. Thus, additional attention and guidance should be given to Medicaid providers to help them with the EHR selection process. Such assistance may be particularly useful to dentists, pediatricians, certified nurse midwives, and obstetricians/gynecologists who have particular needs from EHR functionalities. Recently released guidance from the National Institute of Standards and Technology (NIST), Technical Evaluation, Testing, and Validation of the Usability of Electronic Health Records, may help clarify these issues.<sup>22</sup>

- Educate providers on how to use specific EHR functionalities to achieve MU objectives. Vendors should provide this education, while other entities can address fundamental aspects of changing provider workflow and implementing an EHR, even before addressing optimal practices to achieve specific MU objectives. Based on the results of this study, the highest priority areas for increased training include—

*Practices that are not EHR-system-specific*

- Basic computer skills for providers who are not comfortable working with computers, or alternative suggestions for electronic documentation, such as how to work with scribes or dictation software.
- Skills in maintaining positive patient-provider interactions while using an EHR in the exam room.
- How to optimize workflow when using an EHR.

*Practices that may be specific to EHRs*

- Education on how to navigate through the EHR in a way that can be adapted to a provider's approach to appropriate clinical care for his/her population.
- Efficient charting techniques that can help avoid the need to write on paper and complete electronic documentation after-hours.
- Appropriate use of templates that enhance rather than obscure accurate clinical documentation.
- Education on how to use the EHR functions that seem to offer the greatest challenges. Practices need guidance on how to—

- Implement clinical decision support rules (core).
- Provide electronic copy of health information on request (core).
- Provide clinical summaries of the office visit (core).
- Implement a drug formulary check system (menu).
- Incorporate laboratory tests into EHRs as structured data (menu).
- Use the EHRs to provide patient-specific educational resources (menu).
- Perform medication reconciliation at transitions in care (menu).
- Send patient reminders (menu).
- Provide patients with timely electronic access to their health information (menu).

**Recommendation 3: Promote planning for the Stage 2 MU requirements.**

The proposed Stage 2 MU objectives send a clear message that more of the MU functions will be focused on using EHRs to enhance quality. Thus, it is not too early for Medicaid agencies, RECs, vendors, State HIE entities, and others who are interested in promoting EHR use among Medicaid providers to highlight ways in which EHRs can help improve quality, especially for the Medicaid population. This focus is especially important given the challenges with specific EHR functions and areas of concern that focus group participants reported. Based

on the proposed goals for MU Stage 2, the following processes should be considered a priority for Stage 2 MU:

- Implement clinical decision support rules that address key clinical quality measure areas.
- Incorporate laboratory results as structured data.
- Establish online access for patients to view their health information, and encouraging use of such a feature.
- Provide clinical summaries.

**Recommendation 4: Create a short- and long-term research agenda that addresses many of the sociocultural, technical and training/technical assistance needs of Medicaid providers, and other providers, that have been identified in this study.**

The findings from this study provide significant insight into the practice environments of both urban and rural Medicaid providers who have either adopted EHR technology or may be considering doing so under the Medicaid EHR Incentive Program. Focus group participants provided detailed descriptions of both challenges and successes in their attempts to integrate technology into their workflow and practice settings. While this study focused on Medicaid providers, many of the findings may clearly be useful for any provider considering selecting and implementing an EHR in their practices. Some of the findings indicate a need for followup in the short term because they have operational implications that need to be addressed as soon as possible. Others can be included in an overall research strategy to optimize MU Stage 2 and other State and Federal goals and objectives. Based on this study, the following topics should be considered for further research and consideration:

- Provide information about factors that affect the perceived affordability of EHRs, for different providers and practice types.
- Show how to help providers select EHRs that fit their practice needs and workflow.
- Show how technical assistance can be improved and tailored to different practice settings.
- Provide information about how to streamline clinical documentation practices in EHRs, for providers at all levels of basic computer skills.
- Discuss factors that make templates successful in optimizing clinical documentation in a manner that makes sense to both the clinician entering information and the clinicians who may receive information.
- Discuss implications of EHR workarounds on patient safety.
- Include lessons learned from providers who achieved MU Stage 1, and how those lessons can be applied to assisting providers meet Stage 2 MU goals.

# References

1. Hing E, Burt CW. Are there patient disparities when electronic health records are adopted? *J Health Care Poor Underserved* 2009 May;20(2):473-88. PMID: 19395843.
2. Hsiao C, Hing E, Socey T, Cai B. Electronic health record systems and intent to apply for meaningful use incentives among office-based physicians practices: United States, 2001-2011. *NCHS Data Brief* 2011 November 2011;79.
3. Blumenthal D, DesRoches C, Donelan K, et al. *Health Information Technology in the United States, 2008: Where We Stand*. Robert Wood Johnson Foundation. Washington DC: George Washington University; June 2008. <http://www.rwjf.org/pr/product.jsp?id=31831>.
4. Li C, West-Strum D. Patient panel of underserved populations and adoption of electronic medical record systems by office-based physicians. *Health Serv Res* 2010 Aug;45(4):963-84. PMID: 20403062.
5. Shields AE, Shin P, Leu MG, et al. Adoption of health information technology in community health centers: results of a national survey. *Health Aff (Millwood)* 2007 Sep-Oct;26(5):1373-83. PMID: 17848448.
6. DesRoches CM, Campbell EG, Rao SR, et al. Electronic health records in ambulatory care--a national survey of physicians. *N Engl J Med* 2008 Jul 3;359(1):50-60. PMID: 18565855.
7. Hogan SO, Kissam SM. Measuring meaningful use. *Health Aff* 2010 Apr;29(4):601-6. PMID: ISI:000276360200006.
8. Simon SR, Kaushal R, Cleary PD, et al. Physicians and electronic health records - A statewide survey. *Arch Intern Med* 2007 Mar 12;167(5):507-12. PMID: ISI:000244854400017.
9. Simon SR, McCarthy ML, Kaushal R, et al. Electronic health records: which practices have them, and how are clinicians using them? *J Eval Clin Pract* 2008 Feb;14(1):43-7. PMID: ISI:000252445400006.
10. Bramble JD, Galt KA, Siracuse MV, et al. The relationship between physician practice characteristics and physician adoption of electronic health records. *Health Care Manage Rev* 2010 Jan-Mar;35(1):55-64. PMID: ISI:000273482500007.
11. Egleson N, Kang JH, Collymore D, et al. A health center controlled network's experience in ambulatory care EHR implementation. *J Healthc Inf Manag* 2010 Spring;24(2):28-33. PMID: 20397331.
12. Menachemi N, Yeager VA, Bilello L, et al. Florida doctors seeing Medicaid patients show broad interest in federal incentives for adopting electronic health records. *Health Aff (Millwood)* 2011 Aug;30(8):1461-70. PMID: 21821563.
13. Boonstra A, Broekhuis M. Barriers to the acceptance of electronic medical records by physicians from systematic review to taxonomy and interventions. *BMC Health Serv Res* 2010;10:231. PMID: 20691097.
14. Linder JA, Schnipper JL, Tsurikova R, et al. Barriers to electronic health record use during patient visits. *AMIA Annu Symp Proc* 2006;2006:499-503. PMID: 17238391.
15. Shachak A, Reis S. The impact of electronic medical records on patient-doctor communication during consultation: a narrative literature review. *J Eval Clin Pract* 2009 Aug;15(4):641-9. PMID: 19522722.
16. Underwood WS, Brookstone AJ, Barr MS. The correlation of training duration EHR usability and satisfaction: Implications for meaningful use American EHR partners. October 2011. <http://www.americanehr.com/Libraries/documents/AmericanEHR-Partners-Correlation-Training-Duration-EHR-Usability-Satisfaction-Oct-2011-Final.sflb.ashx>.
17. Ancker JS, Barron Y, Rockoff ML, et al. Use of an electronic patient portal among disadvantaged populations. *J Gen Intern Med* 2011 Oct;26(10):1117-23. PMID: 21647748.
18. Lobach DF, Willis JM, Macri JM, et al. Perceptions of Medicaid beneficiaries regarding the usefulness of accessing personal health information and services through a patient Internet portal. *AMIA Annu Symp Proc* 2006:509-13. PMID: 17238393.
19. Li C. Use of health information technology by office-based physicians: comparison of two contemporaneous public-use physician surveys. *Perspect Health Inf Manag* 2011;8:1f. PMID: 22016672.
20. Bates DW. Physicians and ambulatory electronic health records. *Health Aff (Millwood)* 2005 Sep-Oct;24(5):1180-9. PMID: 16162561.
21. Gans D, Kralewski J, Hammons T, et al. Medical groups' adoption of electronic health records and information systems. *Health Aff (Millwood)*. 2005 Sep-Oct;24(5):1323-33. PMID: 16162580.
22. Lowry S, Quinn M, Ramaiah M, et al. Technical evaluation, testing, and validation of the usability of Electronic Health Records. NISTIR 7804. National Institute of Technology and Standards; 2012. [http://www.nist.gov/healthcare/usability/upload/EUP\\_WER\\_B\\_Version\\_2\\_23\\_12-Final-2.pdf](http://www.nist.gov/healthcare/usability/upload/EUP_WER_B_Version_2_23_12-Final-2.pdf).