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Electronic Health Records Demonstration Evaluation: Implementation Report 2010

Final Report

January 20, 2011

Suzanne Felt-Lisk
Rachel Shapiro
Christopher Fleming
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CONTENTS

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TABLES

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ACRONYMS

ACO	Accountable care organization
ADL	Activities of daily living
ARF	Area Resource File
ARRA	American Recovery and Reinvestment Act of 2009
CAD	Coronary artery disease
CCHIT	Certification Commission for Health Information Technology
CHF	Congestive heart failure
CMS	Centers for Medicare & Medicaid Services
CRISP	Chesapeake Regional Information System for Our Patients
EHR	Electronic health record
EHRD	Electronic Health Record Demonstration
FFS	Fee-for-service
HEDIS	Healthcare Effectiveness Data and Information Set
HHS	U.S. Department of Health and Human Services
HIE	Health information exchange
HITECH	Health Information Technology for Economic and Clinical Health Act
HRSA	Health Resources and Services Administration
IADL	Independent activities of daily living
IDS	Integrated delivery system
IT	Information technology
LHCQF	Louisiana Health Care Quality Forum
MA	Medical assistant
MCMP	Medicare Care Management Performance

MHCC	Maryland Health Care Commission
MUA	Medically underserved area
MUP	Medically underserved population
NCQA	National Committee for Quality Assurance
NPI	National provider identifier
ONC	Office of the National Coordinator
OSS	Office Systems Survey
PQRS	Physician Quality Reporting System
PRHI	Pittsburgh Regional Health Initiative
QIO	Quality Improvement Organization
REC	Regional Extension Center
TIN	Tax identification number

EXECUTIVE SUMMARY

The Electronic Health Record Demonstration (EHRD), funded by the Centers for Medicare & Medicaid Services (CMS), is designed to evaluate whether financial incentives can increase the adoption and effective use of electronic health records (EHRs) by primary care physician practices. Specifically, the demonstration assesses whether providing financial incentives for (1) using EHRs, (2) quality reporting, and (3) demonstrating high-quality performance increases EHR adoption and improves the quality of care practices deliver to chronically ill patients covered by fee-for-service Medicare. The demonstration began in four demonstration sites, which were chosen through a competitive process and announced in June 2008.[1] The demonstration began June 1, 2009, and will continue through May 2014. CMS requires participating practices in these sites, located in Louisiana, Maryland/District of Columbia, southwestern Pennsylvania, and South Dakota (and some counties in bordering states), to implement a certified EHR and use a core minimum set of functions by the end of year 2 of the demonstration.

Mathematica Policy Research was selected through a competitive process to evaluate the demonstration. The purpose of this first evaluation report is to (1) provide a baseline descriptive picture of demonstration practices and their EHR use and care-management activities in order to later contrast it to information gathered toward the end of the demonstration, and (2) identify emerging issues where followup by CMS or others could improve demonstration results.

A. Methods

We provide an overview of the demonstration practices and their participation in the first year through descriptive, tabular analysis of a survey of EHR use and administrative data sources such as a tracking database of practice terminations from the demonstration. We also used telephone interviews with a small set (seven) of the withdrawn practices to enhance the analysis. Because the notes in the tracking database for withdrawn practices were sporadic and brief, we hoped the interviews would help us gain additional insight into the reasons for withdrawal. We also provide a qualitative synthesis of EHR use and care-management activities from the perspective of practice physicians, managers, and clinical support staff in a set of 16 treatment and 8 control group practices we visited during May and June of 2010.[2] In addition, we interviewed the community partner for each site by phone. The community partners, which received no funding from CMS, were responsible for assisting CMS with recruiting practices and also act as broadly knowledgeable, locally involved health information technology (health IT) advocates. To accurately describe the context of the demonstration, we used internet-based research to supplement the interviews. For the most part, the control group practices we visited were similar to the treatment group practices, with a wide range of EHR use and varied care-

[1] 12 sites were initially selected; 4 for Phase 1 and 8 for Phase 2, which was planned to begin a year later. Phase 2 was subsequently canceled as a result of the passage of the HITECH Act.

[2] The EHR Demonstration has an experimental design; practices that applied to participate were randomized into either the treatment or control group. Only the treatment group is eligible for the demonstration financial incentives.

management activities. The value of the control group information will come after a return visit later in the demonstration when we can analyze changes over that period. For this reason, in the executive summary, we focus on results of our analysis of the treatment group practices.

B. Federal, State, and Local Context of the Demonstration

The demonstration is being conducted during a time of rapid change in health IT policy and the incentives and resources available for assistance. In the demonstration's first year, many of the efforts that overlap with demonstration goals and could either enhance or compete with demonstration activities were just gearing up, including the following that were established under the Health Information Technology for Economic and Clinical Health Act (HITECH) within the American Recovery and Reinvestment Act of 2009 (ARRA):

- Medicare and Medicaid EHR incentive programs provide motivation for physicians to undertake "meaningful use" of EHRs beginning in 2011.
- The State Health Information Exchange Cooperative Agreement program supports states in establishing health information exchange capability among health care clinicians and hospitals.
- The Health Information Technology Extension Program funds health IT regional extension centers to provide local technical assistance to support EHR adoption and "meaningful use" in primary care practices (as well as small rural and critical access hospitals).
- A Beacon Community Cooperative Agreement grant (located in one site) is designed to enable health IT and health information exchange capability for safety net or isolated providers. The grant also provides support to reduce health disparities, improve care for clients with diabetes, and encourage smoking cessation.

Beyond HITECH initiatives, state and local projects with similar or overlapping goals include a medical home pilot project in Maryland (set to recruit practices in summer/fall 2010), pay-for-performance and EHR incentive programs by private payers, and state and foundation-funded technical assistance for health IT. These initiatives appear largely complementary to the demonstration and thus could enhance the effectiveness of incentives over an environment where supports were less available. However, they are in the early stages; if they prove to compete for practices' attention, the demonstration's effects could dampen the effects of the demonstration over a less complicated environment.

Because of the demonstration's randomized design, the evaluation will capture the net, unbiased effect of the incentives beyond the other initiatives faced by practices in each site. The evaluation's implementation analysis will track the role of other initiatives in influencing practice change through a few questions on EHR Incentive Program participation within the Office Systems Survey, two sets of calls to withdrawn practices that will identify whether participation in other initiatives is affecting program participation, and another round of site visits near the end of the demonstration that will explore the role of other initiatives as well as the demonstration in prompting changes (see Chapter I).

C. Year 1 Participation

Of 412 practices randomized into the treatment group, 363 (88 percent) remained in the demonstration at the end of year 1. To maintain participation in year 1 they were asked only to complete the Office Systems Survey (OSS) to capture their EHR use. This survey was fielded toward the end of the first year (April 19- June 14, 2010).

Of the 363 practices that remained in the demonstration, 93 percent completed the OSS. Of those that completed the OSS, 70 percent used an EHR at the time of the survey and the remaining 30 percent did not (these numbers drop to 65 percent and 35 percent as in the table just below if one assumes that practices that did not respond to the OSS do not use an EHR). Although most of the practices with no EHR reported they had plans to implement one in the next 12 months, 16 practices with no EHR reported having no such plans. The pace of adopting an EHR will need to increase rapidly this year if all the practices are to remain in the demonstration at the end of year 2.

The participating practices we visited were not highly engaged in the project at the time of our visit, as indicated by a low awareness of specific project features and low levels of response to the demonstration. Only 5 of the 16 treatment group practices visited reported that the demonstration had influenced them in any way. For those that were influenced, the influence was to speed up or heighten attention to adopting an EHR, or in one case to provide a structure (through the OSS) for planning enhancements to EHR use.

D. Use of Electronic Health Records

Among demonstration participants, the percentage that are using an EHR has risen sharply from 45 percent at the time of their application to the demonstration, to 65 percent at the end of year 1 (about an 18-month period).[3] Pennsylvania practices showed the largest increase, rising from 44 percent using an EHR at demonstration start, to 71 percent at the end of year 1, while Louisiana practices showed the least progress, with a rise from 41 percent to 52 percent using an EHR. Note that the pace of adopting an EHR will need to further increase this year (more than double) if all the currently participating practices are to remain in the demonstration after the end of year 2.

[3] For this analysis, practices that did not respond to the OSS were counted as not having an EHR at the time of the survey, although it is possible that some do use one.

Table ES.1. Adoption of EHRs Among Demonstration Participants

	All	Louisiana	Maryland	Pennsylvania	South Dakota
Number of Participating Practices	363	86	114	126	37
Percent That Had an EHR at Demonstration Start	45	41	52	44	41
Percent Using an EHR, End of Year 1	65	52	69	71	65

Source: Application data, Year 1 OSS.

Note: 25 practices did not respond to the year 1 OSS, so their use of an EHR at present is unknown (we suspect most do not have an EHR). These practices are included in the denominator for the percent using an EHR, end year 1.

Over two-thirds of the treatment group practices (including demonstration participants and non-participants) that responded to the OSS use an EHR system. Over 80 percent of these practices received technical assistance in implementing their systems, mostly from vendors or units within larger affiliated organizations. About half of those with health IT no longer pulled charts on a routine basis for patient visits, although many practices continue to scan in paper versions of laboratory and imaging results for most patients (39 and 47 percent, respectively), a technique that does not leave these results readily available for searching and quality reporting. The one characteristic that may play a role in helping practices fully implement EHRs is their participation in quality improvement initiatives: practices participating in at least one other quality improvement, pay-for-performance, or EHR program outside the demonstration were more likely to report more robust EHR use.

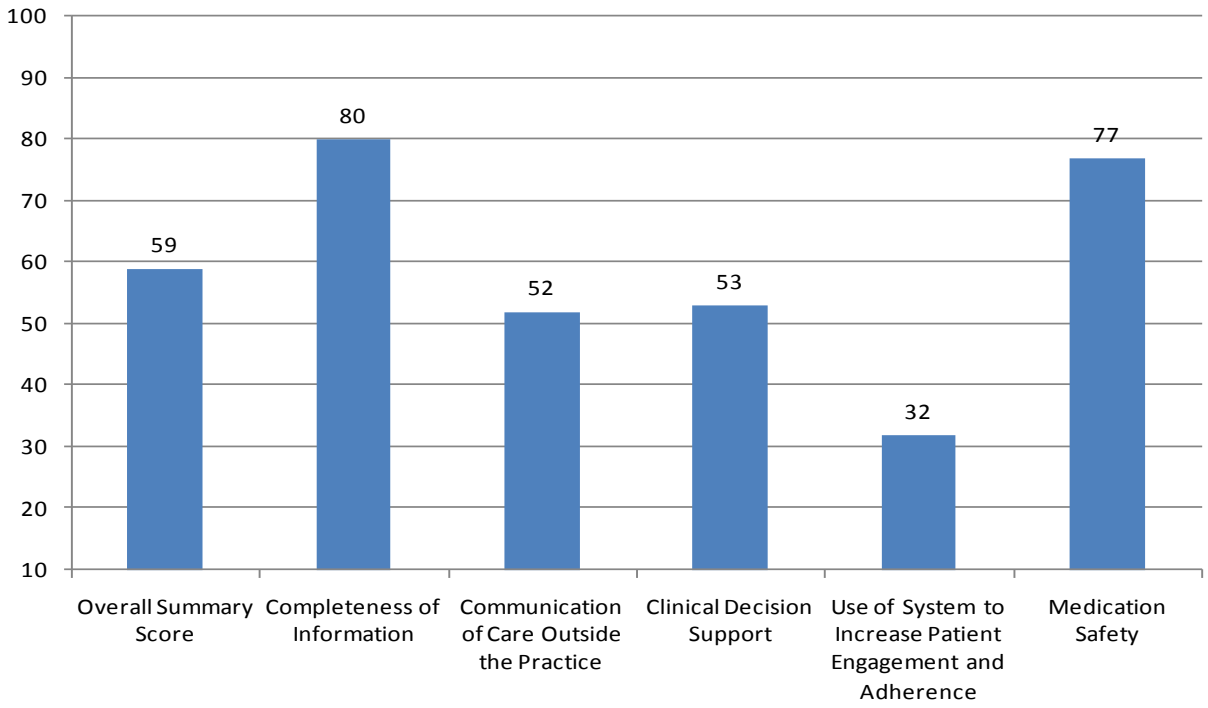
Physicians and staff of practices we visited commented on several barriers to adoption and use of EHRs. While staff members we interviewed at practices with EHRs were committed to using their EHRs, they noted several hurdles to their effective use, including the time and labor necessary to implement the systems, the complexity of the electronic systems, lack of interoperability with other systems, and insufficient technical support. Those without EHRs were hindered by the expected high costs of adoption, both in terms of money and labor; although three of the four practices we visited without EHRs were committed to adopting an EHR within a year. The fourth was a solo practitioner in a rural area who was experiencing a declining revenue stream and found that the available incentives would not cover the system costs.

The major factor that seemed to be influencing practices to adopt EHRs was the national trend toward adoption—the perception that this is how business will need be done in the future. Three practices also decided to adopt EHRs to promote interoperability with the associated hospital system and, if associated with a larger group, other practices. When asked what factors have been helpful in acquiring and implementing their EHR, practices often pointed to strong training or strong advisory groups or resources. Strong training included high-quality vendor support or in one instance an IT supervisor who was a former high school teacher, while strong advisory groups included steering committees that were formed at the practice or larger medical group level. In one case a consulting firm was hired to manage the transition, to avoid overloading existing administrative staff. A user group for the practice's EHR system was cited as another helpful resource. Finally, one medical group that owns a visited practice identified specific staff and physicians who receive additional compensation for being the point person for questions on EHR use. The same group uses data to identify physicians not using the EHR well,

and proactively provides personal assistance. This group also ties a small portion of physician salaries to EHR use.

Most practices using EHRs reported that their electronic medical records included most of the items queried regarding the completeness of the records, and that they routinely used functions related to medication safety (Figure ES-1). This is seen through a high average score (80 percent) on the OSS domain "completeness of information," which includes their stage of transition from paper records, the inclusion of basic content such as demographics, medical histories, allergy lists, problem/diagnosis lists, and their inclusion of lab and radiology orders and results. Similarly, most practices routinely used EHR functions relevant to medication safety, with an average domain score of 76 percent on use of functions such as generating new prescriptions and refills from their system, screening prescriptions for drug allergies, drug-drug interactions, drug-lab interactions, and drug-disease interactions.

Figure ES.1. Average OSS Scores, by Domain, for 198 Treatment Group Practices Meeting Minimum EHR Use Requirements to be Scored



Note: Table II.6 lists the specific EHR functions associated with each domain. The OSS instrument is found in Appendix A along with the scoring plan (how the overall summary score and domain scores were calculated) and more detailed results for each EHR function. The overall summary score does not include up to 3 additional points given per practice for current EHR certification.

In contrast, EHR use on the other three domains—communication of care outside the practice, clinical decision support, and use of the system to increase patient engagement and adherence—was much lower, with the average patient engagement and adherence score lowest at only 32 percent. Problem areas included lack of electronic interfaces with patients and other clinicians, over-sensitivity of alerts and reminders that discouraged their routine use, and infrequent use of the system to generate, review, and modify a care plan to help guide

chronically ill patients in self-management. In addition, only between 28 and 35 percent of practices (depending on the chronic condition) used their system to provide reminders to most of the relevant chronically ill patients for needed tests or services.

E. Care Management

Our visits to practices found that there is room for much growth in care management as the demonstration progresses. The good news is that all but 2 of the 16 treatment group practices we visited articulated one or more care-management activities, defined as routines designed to improve patient care. However, all—including two practices that were considerably more advanced than the others—had a long way to go to achieve the advanced primary care medical home ideals beginning to be embodied by the "meaningful use" criteria and laid out in medical home joint principles endorsed by major physician organizations.

At the time of our visits, six of the 16 practices were using front desk and medical assistant staff to help update patient information and identify and/or fill gaps in missing preventive services. Five discussed using flags, alerts, and reminders, including some that use paper charts rather than EHRs. Three routinely give patients individualized guidance, and a few do other things, including one that has about 20 standing orders in place, whereby care can be given or referred under specific circumstances without the physician initiating the order, which the practice believes has boosted its quality performance and improved the consistency of patient care for the targeted services (such as pneumonia vaccine).

In terms of care beyond the patient visit, 7 of the 16 practices were calling or sending letters to at least some patients who were identified as needing a service; 3 have a process in place to obtain information from a patient's other clinicians; and others have a case manager made available by the local hospital (1 practice) or a patient portal that they populate with key information after each visit to support patients and family members in accurately remembering care instructions and self-management guidance (1 practice).

F. Key Findings and Considerations

1. The environment of relevant programs and resources operating alongside the demonstration is increasingly complex.

Consideration: CMS may want to consider informing or assisting the community partners in informing practices of how or where the demonstration fits with other relevant initiatives, as practices will be more willing to exert effort to change if it is clear that the changes support reward from multiple initiatives. This would need to be done site by site and coordinated with those major efforts to ensure clear and accurate communication.

2. Visited practices were not highly engaged in the demonstration in year 1.

Consideration: This finding is a function of demonstration design, because required activities in year 1 were minimal and minimum EHR use requirements do not apply until the end of year 2. As CMS moves forward with other incentive-based programs, a similar situation may occur where most of the dollars could be paid to practices that have done nothing to improve their EHR use or quality. CMS may want to consider if this is an acceptable, inherent feature of any program that realigns incentives toward quality, or

whether incentive design in future programs should be targeted toward rewarding new health IT adoption or improvements in use (or improvements in quality).

Note that this assessment applies only to the first year of the demonstration. It is possible that practices will become more engaged in year 2 and beyond and will produce a more favorable situation where a large majority of practices respond to the demonstration incentive and program incentive dollars are thus spread mostly among practices that are improving EHR use and patient care.

3. **The largest opportunities for improved EHR use among current users are in the areas of using the system to increase patient engagement and adherence, employing it for clinical decision support, and communicating about care that takes place outside the primary care practice.**

   Consideration: CMS may want to highlight to both treatment and control practices the potential for improvement in these areas, and with the help of the community partners point them to specific technical assistance resources. To the treatment practices only, CMS could highlight the financial reward (systems payment) that would go along with higher scores in these domains. Some care management is common in the demonstration practices, but was quite limited in scope and scale.

   The site visits validated the sense from the OSS survey results that while some care management was occurring, its overall scope and scale was quite limited. While not all care management was taking place using the EHR as a tool, the potential for EHRs to advance care-management capabilities was widely recognized. Taken as a group, the practices had implemented an interesting array of care-management activities that varied in their approach but tended to emphasize teamwork beyond the physician. The primary importance of this finding is to support the demonstration's embedded concept that there are many actions practices could take, if the demonstration incentives and/or other factors motivate them, to improve patient care.

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PART I:

SYNTHESIS REPORT

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I. INTRODUCTION AND CONTEXT OF THE DEMONSTRATION

The Electronic Health Record Demonstration (EHRD) is a five-year demonstration that targets primary care practices in four sites: Louisiana, Maryland and the District of Columbia, southwest Pennsylvania, and South Dakota (and some counties in bordering states). The EHRD tests whether performance-based financial incentives increase physician practices' adoption and use of electronic health records (EHRs) and improve the quality of care delivered to chronically ill patients with fee-for-service (FFS) Medicare coverage. Authorized under Section 402 Medicare Waiver Authority and implemented by the Centers for Medicare & Medicaid Services (CMS), the EHRD demonstration expands upon the Medicare Care Management Performance (MCMP) demonstration and builds upon other CMS demonstrations. Unlike the MCMP demonstration, which merely encouraged the use of EHRs, the EHRD requires practices to implement an EHR certified by the Certification Commission for Health Information Technology (CCHIT)[4] and use a core minimum set of functions by the end of Year 2 of the demonstration.

CMS selected Mathematica Policy Research as the independent evaluator of the demonstration. The main goal of the evaluation is to provide CMS with valid estimates of the incremental effect, or *impact*, of providing financial incentives to physician group practices to adopt and improve the use of EHRs and to improve the quality of care for chronically ill Medicare beneficiaries served by these practices. The evaluation also includes (1) an implementation analysis to study the implementation of the demonstration and the operational responses of the demonstration practices and (2) a trend analysis to examine how the mean value of quality measures submitted by treatment group practices changes, as the demonstration incentives shift from payment for reporting alone to payment for performance.

The purpose of this first report from the evaluation is to describe (1) implementation of the demonstration during its first year and (2) implementation and operational experiences of four primary care practices in each of the four sites participating in the demonstration, along with those of two control practices in each site. In Part I, the synthesis report, we first describe the context of the demonstration, including its structure and requirements, its place in relation to other existing federal and private-sector programs, and the methodology for analysis presented in the report. In Chapter II we provide an overview of the demonstration, and describe the involvement of community partners, participation by demonstration practices in year 1, practice characteristics, and use of health information technology (health IT) by the demonstration practices. In Chapter III we focus on the visited practices' progress, issues, and concerns related to health IT. In Chapter IV we describe the visited practices' efforts in managing care and measuring quality of care; in Chapter V we synthesize our findings from practice contacts across the sites, offer a brief conclusion and summary of implications, and detail the matters we should continue to observe as the demonstration and evaluation continue. Part II is a summary of the site visit findings for each of the four sites.

[4] Now that entities in addition to CCHIT have been federally approved to certify EHRs for the Medicare and Medicaid Incentive Programs, demonstration practices may meet this requirement through certifications by these other entities as well as CCHIT.

A. Demonstration Structure and Requirements

1. Targeted Practices

The EHRD targeted practices serving at least 50 traditional FFS Medicare beneficiaries with certain chronic conditions for whom the practices provide primary care. Under this demonstration, primary care providers[5] in practices with 20 or fewer providers (some exceptions were made) are eligible to earn incentive payments for (1) using the minimum functions of a certified EHR; (2) reporting 26 quality measures for congestive heart failure (CHF), coronary artery disease (CAD), diabetes, and preventive health services; and (3) achieving specified standards on clinical performance measures during the five-year demonstration period.

The Secretary of the Department of Health and Human Services (HHS) directed CMS to develop the EHRD under Section 402 Medicare Waiver Authority. Initially the demonstration was planned to be implemented in 12 sites in two phases one year apart. CMS chose four sites for Phase I: Louisiana, Maryland and the District of Columbia, southwest Pennsylvania, and South Dakota (and some counties in bordering states) as the four demonstration sites. Phase II consisted of eight additional sites to start a year later. In April 2009, CMS canceled Phase II as a result of the incentive provisions under the American Recovery and Reinvestment Act of 2009 (ARRA).

Selection of sites was based on a nationwide competitive process to identify community partners to assist CMS with education, outreach activities, and recruiting physician practices in each site. Community partners were consortia that included major stakeholders such as local provider professional associations, public organizations (such as the Maryland Health Care Commission and the South Dakota Department of Health), major health plans, Medicare Quality Improvement Organizations, and other important health care organizations (see Appendix D for community partners for the four demonstration sites). Recruitment of practices by the community partners began on September 2, 2008, and the enrollment period ended on November 26, 2008. The demonstration began on June 1, 2009 and will end on May 31, 2014.

Demonstration practices are defined by one or more tax identification numbers (TINs). Providers are linked to each practice using individual Medicare national provider identifiers (NPIs). Medicare beneficiaries will be identified as linked to these practices if they live in a demonstration site and are treated for the targeted conditions by primary care providers or by medical subspecialties likely to provide primary care, and who are covered under traditional FFS Medicare for both Part A and Part B coverage.[6] Through several contractors, CMS will collect data from the practices on the

[5] The following providers are eligible to participate in the EHRD if they provide primary care: general practice, family medicine, internal medicine, geriatrics, and such medical subspecialists as cardiologists and endocrinologists and others who completed an internal medicine residency.

[6] Beneficiaries for whom Medicare is not the primary source of insurance coverage or whose care is managed by a hospice program will be excluded from the demonstration. In addition to three primary target chronic conditions—congestive heart failure, coronary artery disease, and diabetes mellitus—eligible conditions are: Alzheimer's disease or other mental health condition; other chronic cardiac or circulatory disease; kidney disease; lung disease; any cancer; and arthritis and osteoporosis. These conditions are identified through ICD-9-CM diagnosis codes available in Medicare claims data (Wilkin et al. 2007).

clinical measures for years 2-5. The number and characteristics of practices that were randomized into the treatment and control groups are shown in Table I.1.

Table I.1. Characteristics of Randomized Practices

	Treatment					Control				
	All	LA	MD	PA	SD	All	LA	MD	PA	SD
Number of Randomized Practices	412	104	127	138	43	413	100	128	141	44
Mean Number of Providers (SD)	3.8 (4.0)	3.4 (3.9)	3.9 (4.2)	3.5 (3.7)	5.3 (4.2)	3.7 (3.9)	3.1 (3.1)	3.9 (4.2)	3.3 (3.2)	6.0 (5.5)
Percent Practices with 1 or 2 Providers	52	58	51	55	28	53	62	52	54	30
Median Number of Assigned Medicare Fee-for-Service Beneficiaries per Practice (range)	195 (0-2,194)	193 (0-1,262)	226 (0-1,723)	115 (1-1,151)	316 (1-2,194	181 (0-2,289)	179 (0-1,203)	203 (0-1,862)	111 (1-731)	332 (1-2,289)
Percent Rural	17	21	5	7	74	15	19	6	5	61
Percent in MUA	29	49	17	30	16	30	50	17	30	18
Percent with an EHR at Time of Application	43	39	48	41	37	44	43	51	40	36

SD = standard deviation.

Sources: Number of providers and EHR at time of application are from application data; rural status is from the Area Resource File; MUA is from HRSA data; and number of assigned Medicare fee-for-service beneficiaries is from baseline Medicare claims data, with assignment determined by the demonstration's implementation contractor.

2. Incentive Structure

Demonstration practices are eligible to receive as many as three types of incentive payments. The first, called the *systems* payment, (up to $5,000 per physician to a maximum of $25,000 per practice) is based on using an EHR. It is available to practices in all five years of the demonstration. Practices will receive up to $45 per beneficiary (for beneficiaries with chronic conditions who have been linked to the practice) based on their performance on the OSS (CMS 2008).[7] To be eligible to receive any of this incentive, practices must meet minimum EHR use requirements to have a certified EHR, record visit notes, record diagnostic test orders and results, and record prescriptions. Practices that use more EHR functions related to the following domains will get progressively more of the maximum per-beneficiary payment: completeness of information, communication of care outside the practice, clinical decision support, use of the system to increase patient engagement and adherence, and medication safety. Of the $45 maximum payment, the practice will receive $13.50 per beneficiary for meeting the core minimum function requirements. A single overall score on the survey is used to calculate the percentage of the remaining $31.50 per beneficiary that the practice will receive. Hence, for

[7] Beneficiaries are linked to the practice based on who provides most of their primary care as assessed from claims data.

year 1, a practice with two or more providers that has 200 beneficiaries with chronic conditions assigned to it, meets the minimum EHR use requirements and scores 60 percent on the survey would receive $6,480 ((200 x $13.50) + (200 x $31.50 x 60 percent)) (see Appendix A, Sections 1 and 2 for the survey instrument and scoring method, respectively).

In Year 2, practices have the opportunity to receive systems payments and a second type of payment (a per-beneficiary payment that may total up to $3,000 per physician or $15,000 per practice) for *reporting* on specific clinical quality measures. (Practices that have not adopted and met minimum EHR use requirements by the end of the second year will be removed from the demonstration.)

In Years 3 to 5, practices will have the opportunity to receive systems payments and a third type of payment (a per-beneficiary payment that may total up to $10,000 per physician or a maximum of $50,000 per practice) for *performance* on specific clinical quality measures. The financial payments will be in addition to the normal FFS Medicare payment practices receive for services delivered. Depending on both their number of beneficiaries and their quality and systems scores, practices could receive up to $58,000 per provider, up to a maximum of $290,000, per practice over the five years of the demonstration (Wilkin et al. 2007).

B. Relevant Federal Program Environment

The passage of both the federal economic stimulus package in 2009 (the American Recovery and Reinvestment Act of 2009 (ARRA)) and health care reform legislation in March 2010 (the Patient Protection and Affordable Care Act and an associated bill, the Healthcare and Education Reconciliation Act of 2010), has implications for Medicare and Medicaid providers. Several provisions in the legislation are relevant to providers participating in the EHRD, as the federal government will implement new programs and policies over the next several years that will overlap and provide complementary opportunities for providers participating in EHRD. We summarize some of these upcoming programs and policy changes below.

The HITECH Act. The Health Information Technology for Economic and Clinical Health Act (HITECH) was passed as part of ARRA. Of the several programs created by HITECH legislation,[8] the most relevant ones are the Medicare and Medicaid EHR Incentive Programs for demonstrating "meaningful use" of EHRs. The meaningful use concept in the HITECH Act is the same as that which is the focus of the demonstration—if EHRs are to bring benefits to the health care system, they must be intentionally used in ways that promote quality care. Parameters of these programs for the first two years (2011-2012) were finalized through a final rule published by CMS on July 28, 2010. Beginning in 2011, eligible providers can begin receiving payments under either the Medicare or Medicaid EHR Incentive Programs for demonstrating meaningful EHR use, which includes meeting a core set of required criteria and several criteria providers may choose from a menu set. The criteria overlap with but also contain differences from the demonstration's EHR criteria. Appendix B provides an overview of the overlaps and divergence of the two efforts. Participation in the EHRD does not preclude

[8] To find more information on all of the HITECH programs, visit ONC's website: http://healthit.hhs.gov/portal/server.pt?open=512&objID=1487&parentname=CommunityPage&parentid=28&mode=2&in_hi_userid=11113&cached=true

providers from receiving payments through the Medicare or Medicaid incentive program. Beginning in 2015, Medicare payments will be reduced for providers who do not submit data on quality measures for covered professional services.

Also of relevance, due to the EHRD's requirement that *certified* EHRs be used, are provisions establishing an EHR certification process for the Medicare and Medicaid EHR Incentive Programs. While the CCHIT has been the only EHR certification entity through year 1 of the demonstration, the national need to certify EHRs that are capable of supporting meaningful-use requirements led the Office of the National Coordinator (ONC) to establish a temporary certification program in 2010 and to name additional organizations that are authorized to certify EHRs. (CMS is allowing practices to meet EHRD certification requirements if their EHR is certified by these entities.)

There are other programs initiated by the HITECH Act that are relevant to both EHRD practices and other physician practices. We briefly describe some of them below.

- **State Health Information Exchange Cooperative Agreement Program.** This is a grant program to support states or state-designated entities in establishing health information exchange (HIE) capability among health care providers and hospitals in their jurisdictions. When operational, these entities could help practices participating in EHRD achieve higher scores on the OSS. Grants were awarded to Maryland, South Dakota, Louisiana, and Pennsylvania in February - March 2010.
- **Health IT Extension Program.** Health IT Regional Extension Centers (RECs) have been and continue to be established under this program. RECs will offer technical assistance, guidance, and information on best practices to support and accelerate health care providers' efforts to become meaningful users of EHRs. Funds were awarded to begin the RECs in February - April 2010. The RECs covering all four sites of the demonstration were still gearing up to provide these services at the time of our interviews in May and June 2010. In future years, however, demonstration practices may take advantage of these resources to improve their EHR use. In three instances, the lead community partner organization for EHRD is a part of the REC.
- **Beacon Community Program.** This a grant program designed for communities to build and strengthen their health IT infrastructure and exchange capabilities. Policymakers envision these communities demonstrating ways by which hospitals, physician practices, and patients may effectively share data to facilitate efficient and high-quality patient care. In May 2010, ONC made awards in the form of cooperative agreements to 15 nonprofit organizations, and two more were added in September 2010. One was in the New Orleans area, potentially boosting performance over time of Louisiana demonstration participants.

PQRS provisions in the Patient Protection and Affordable Care Act. The Affordable Care Act extends the Physician Quality Reporting System (PQRS, formerly known as the Physician Quality Reporting Initiative) through 2014. Since some of the reporting measures dovetail with the demonstration quality measures, synergy between these efforts could foster greater attention to demonstration measures and quality improvement. Historically most reporting to PQRS has been through claims, however, this may be changing; for 2011, 20 PQRS measures can be reported through EHRs, including some of the measures that are the focus of the EHR demonstration. For years 2011-2014, the Affordable Care Act also allows an additional

incentive payment increase by 0.5 percentage points for physicians who satisfactorily submit data on quality measures for a year through a Maintenance of Certification Program.[9]

Medicare Shared Savings Program. The Affordable Care Act also establishes several demonstrations and programs. The Medicare Shared Savings Program, to be established by January 12, 2012, is another potential opportunity for practices in EHRD (as well as outside it) to build on their pay-for-performance involvement. The program will allow qualifying providers to organize as an Accountable Care Organization (ACO). Providers in ACOs become jointly responsible for the quality and cost of care provided to patients assigned to their ACO. Providers in an ACO will share in any cost savings they achieve.[10]

These federal initiatives and the state and private-sector initiatives described below appear largely complementary to the demonstration and thus could enhance the effectiveness of incentives over an environment where supports were less available. However, they are in the early stages; if they prove to compete for practices' attention, the demonstration's effects could dampen the effects of the demonstration over a less complicated environment.

Because of the demonstration's randomized design, the evaluation will capture the net, unbiased effect of the incentives beyond the other initiatives faced by practices in each site. The evaluation's implementation analysis will track the role of other initiatives in influencing practice change through a few questions on EHR Incentive Program participation within the Office Systems Survey, two sets of calls to withdrawn practices that will identify whether participation in other initiatives is affecting program participation, and another round of site visits near the end of the demonstration that will explore the role of other initiatives as well as the demonstration in prompting changes.

C. State and Private-Sector Environment in the Four Sites

Site-specific initiatives that overlap with and complement the demonstration by supporting primary care practices' EHR implementation and care management include the following:

- **Maryland and District of Columbia**
  - Legislation passed in May 2010 will require Maryland private payers to build EHR incentives into their payment systems, aligned with the ARRA meaningful-use requirements, beginning in 2011. (Maryland is one of only three states nationally that have passed laws requiring or incentivizing EHR adoption.)
  - State legislation also provided for the Maryland Health Care Commission (one of the community partners) to offer training and support to management services organizations that implement EHRs. Practices both inside and

[9] Maintenance of Certification is the process of keeping physician certification up-to-date through one of the 24 approved medical specialty boards of the American Board of Medical Specialties.

[10] Section 3022 of HR3590, final as passed by both the House and the Senate: http://thomas.loc.gov/cgi-bin/query/F?c111:1:./temp/~c111QKfDs5:e893478:

outside the demonstration would be able to contact them for help if they were implementing an ASP-model EHR, a type of EHR where the data are stored off-site. The set-up cost is lower than for locally hosted EHRs, possibly making them attractive to smaller practices.

- The Patient-Centered Medical Home pilot project (including incentives and quality measurement) run by the Maryland Health Care Commission hoped to sign up 50 practices by fall 2010, and to begin demonstration activities in January 2011. Practices that qualify as medical homes would begin to get enhanced reimbursement from Medicaid managed care organizations beginning in mid-2011.
- The District of Columbia Regional Health Information Organization, begun with funding from the DC Department of Health, allows for some health information exchange between a small set of hospitals and health centers. Information was not available at the time of this report on whether it has firm plans to expand during the project period.

- **Southwest Pennsylvania**
  - A large private payer has a pay-for-performance program that includes reward for implementation and use of more functions within their EHR. The same payer is making AllScripts electronic prescribing available free of charge to all practices in the region.
  - The governor's office is promoting a chronic care initiative throughout the state, and one element focuses on health IT, a diabetes registry (including reporting monthly), and care management. About two dozen practices in the region participate, including several in the EHRD demonstration or control group.
  - Funded by the Highmark and Jewish Healthcare Foundations, the Pittsburgh Regional Healthcare Initiative (one of the community partners) is offering personal coaching on EHR implementation to both treatment and control practices free of charge. The hope is that demand for these services will increase as the second year of the demonstration begins and more practices contemplate the upcoming ARRA/HITECH incentives.

- **South Dakota** (and some counties in neighboring states)
  - One large payer provides financial incentives for achieving quality targets.
  - Two large integrated health systems are bringing all their affiliated practices onto EHRs, including but not limited to practices in the demonstration treatment and control groups. One is in the third year of its five-year project involving 110 clinics; one is in the second of a four-year project.
  - The community partner for the EHR Demonstration (the South Dakota eHealth Collaborative) was designated by the state secretary of health to implement health IT and HIE in the state, to advance adoption of health IT.

- The Minnesota Community Measurement program is a statewide public reporting program with no payment incentives, in which some demonstration practices participate.

- **Louisiana**
  - In spring 2010, organizations in the New Orleans area received a $13.5 million Beacon Community Cooperative agreement from the ONC. Led by the Louisiana Public Health Institute, the aim is to enable health IT/HIE capability for safety net or isolated providers as well as to reduce health disparities, improve diabetes care, and encourage smoking cessation.
  - One to two years of work also remain under $16 million in Primary Care Access and Stabilization grants, funded by HHS and administered by the Louisiana Public Health Institute, which included assistance to safety net providers with implementing EHRs.

D. Methodology

To achieve the first goal of the evaluation—describing the implementation of the demonstration in its first year—we used descriptive, tabular analysis by site and across all four sites, drawing on several administrative data sets as well as OSS data. To achieve the second goal—to document the operational experience of the four treatment and the two control group practices in each site—we coded themes from our detailed site visit notes, and present those themes below along with examples to illustrate the main points. In addition to the overall summary provided in Part I of this report, Part II provides a site-by-site summary of the practices' first-year experiences.

1. Site Visits

For each site, we selected four demonstration practices and two control practices for case study. Practices were visited by a two-person team during May and June 2010. To select practices for site visits, we followed several steps. First, we reviewed data from the practice applications database (provided by the CMS implementation support contractor for the demonstration). We used these data to create a table for each site that displayed practice name, city, number of providers, number of Medicare FFS beneficiaries, number of beneficiaries with selected chronic conditions, and the practice organization description.[11] Next, we mapped all demonstration and control practices based on their addresses, using Geographic Information System software, to identify the four demonstration and two control practices in each of the four sites that we could feasibly visit during a one-week period. We also selected practices that would provide a mix in terms of urban/rural location, use of health IT, number of providers, number of FFS Medicare beneficiaries, and number of beneficiaries with each chronic condition.

In reviewing practice names and descriptions, in many cases it was evident that the practice was owned or managed by a particular practice group; if so, we made an effort to ensure a range

[11] The practice organization descriptions vary, but usually mention ownership, range of services, and/or location information.

of both independent practices and those that are owned or managed by a larger organization. However, we were unable to completely achieve this goal; for instance, in South Dakota, several of the treatment and control practices we visited were associated with one larger medical group. In addition, several of the practices we visited across all sites were associated with larger medical groups that had both treatment and control practices.

Of the 24 originally selected practices (16 treatment and 8 control), we visited 17 and secured replacements for 7. It was particularly difficult to get solo practices to agree to participate; they often did not respond to our requests or said they were too busy. The substitutes we chose closely matched the characteristics of the originally selected practice.

Discussions were usually held with at least two people per practice—a physician and an administrative staff member knowledgeable about the demonstration. When possible, we also spoke with nurses and medical assistants (MAs), as well as with the medical director and such administrative personnel as the chief information officer and chief financial officer, if applicable. The discussions lasted one to two hours per practice. At times, practices on their own initiative included additional physicians, administrators, nurses, or corporate staff to add to the discussion. In one case, the solo practitioner himself was the sole interviewee; he alone had been responsible for the decision to participate in the demonstration and for data submission.

Key topics covered during discussion with demonstration practices were:

- Experience with and perspectives about the demonstration[12]
- Adaptation of practice operations as health IT is implemented and observed effects
- Factors that helped or hindered practices in adopting and implementing health IT
- External factors that may affect the demonstration's impact, such as other incentives, reporting programs, and health IT initiatives
- Experience with care-management processes, and their views on care management
- Quality performance awareness (such as whether the practice tracks its own performance or reviews performance reports from other payers)

The topics were adapted for practices without health IT in place, and included questions about their views on and any plans for adopting health IT. Control practices were asked about all of the aforementioned topics except for those related to the demonstration.

Within a few weeks of each visit, we prepared detailed documentation and drafted a statewide synthesis. We then reviewed the syntheses, identified overall themes, and coded each practice on relevant themes and facts based on our detailed notes in order to prepare the counts embedded throughout the remainder of the report.

[12] Note that in the first year, the only responsibility of the demonstration practices was to complete the OSS; practices had until the end of the second year before they were required to have adopted a certified EHR and be using minimum core functions.

2. The Office Systems Survey

We administered a web-based OSS on behalf of CMS to treatment practices during spring 2010. The OSS collected information on practice characteristics, provider characteristics, and use of EHRs and other health IT. In order to score practices' implementation of EHRs for the demonstration, the OSS measured specific EHR functions for practices currently using an EHR. These functions included prescribing medications, ordering laboratory tests and other procedures, and care management and coordination (see Appendix A).

All practices that had been randomized to the treatment group were asked to participate, with the exception of 7 that CMS determined had failed to meet terms and conditions of the demonstration. The 405 practices included 368 participating in the EHR demonstration and 37 that had voluntarily withdrawn from the demonstration. We mailed an advance letter and sent an email inviting participation. The letter and email included a link to the website, and a unique password and login identification number to access the web survey. We sent email reminders and made telephone calls throughout the field period to nonresponding practices. We also established a toll free number and an email address for receiving survey related questions. The survey was fielded over a nine-week period from mid-April until mid-June.

Of the 405 practices, 354 responded to the OSS and 352 completed a survey (the other two were partially completed). We achieved a final response rate of 87.4 percent (92 percent among participating demonstration practices and 35 percent among withdrawn practices). Two practices were closed (a third closed after completing the OSS) and two had merged with another practice.

3. Telephone Contacts to Withdrawn Practices

In June and July 2010, 10 practices that had voluntarily withdrawn from the demonstration were contacted for a brief telephone discussion about the reason(s) for their withdrawal. The practices identified for contact were all those that had voluntarily withdrawn and had no other information noted in the database that recorded their withdrawal to indicate a reason. We were able to learn the reason for withdrawal from 7 of the practices (the other 3 did not respond to our inquiries). This information was combined with information noted in the demonstration tracking database (explained below), in order to give the broadest possible picture of reasons for withdrawal.

4. Other Data Sources

Administrative data were also used in Chapter II, where we provide an overview of demonstration practice characteristics and analyze OSS data for patterns by practice characteristics:

- **Demonstration tracking database.** The tracking database maintained by another CMS contractor and provided to Mathematica was used to assess the number of practices participating in the demonstration, and as one source to identify reasons for voluntary withdrawals.
- **Demonstration application data.** The size of practices' Medicare FFS population was self-reported by practices as part of their application to the demonstration.

- **Area Resource File (ARF):** The ARF was used to identify urban/rural location based on metropolitan versus non-metropolitan counties (a crude but commonly used method of designating an area as rural).
- **HRSA data:** Medically Underserved Area (MUA)/Medically Underserved Population (MUP) status identified by Mathematica using data from the Health Resources and Services Administration (HRSA). Specifically, each practice's primary location was geocoded and merged with HRSA data by census tract. Addresses for which tracts were not available, and those for which HRSA reported only metropolitan area information, were manually entered into the HRSA website to determine their MUA/P status. Because MUA and MUP are not differentiated in the manual web-based data tool, we were unable to determine the MUA status alone of all practices. Therefore, we used the combined MUA/MUP measure identifying practices that are either in an MUA or an MUP. We use "MUA" throughout the report to mean MUA or MUP.
- **Medicare claims data:** Medicare claims data for baseline and year 1 were used to calculate the number of assigned Medicare free-for-service beneficiaries per practice; assignment was determined by the demonstration's implementation contractor.

E. Limitations

The small number of treatment and control group practices visited, along with the nonrandom selection methodology, means we cannot assume the visited practices represent all demonstration and control group practices. Appendix C shows the visited practices' characteristics alongside the characteristics of treatment and control group practices not visited. Visited treatment group practices closely mirror other treatment group practices' characteristics except in terms of affiliation, and we believe some treatment group practices erred on their OSS response or misinterpreted the question. We count 56 percent of the visited treatment group practices as affiliated with a larger organization based on our site visit notes, whereas only 27 percent responded to the OSS that they were affiliated. Visited control group practices tended to provide more service to Medicare beneficiaries than other control practices, with all of them reporting 1,000 or more Medicare FFS beneficiaries on their application. Further, national generalizations cannot be made: the recruitment experience information discussed in Chapter II suggests that the demonstration practices are probably more advanced in their thinking about and use of EHRs than other small practices nationally. Also, we note that the OSS data are self-reported data on EHR use, with simple attestation by respondents of accuracy rather than independent verification.

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II. OVERVIEW OF THE DEMONSTRATION

In this chapter we provide an overview of the demonstration as a whole before we zoom in on the specifics of EHR use and care management in the chapters that follow. First, we summarize the comments of the community partners in each site regarding their recruitment experience and their sense of the difficulties the demonstration may face moving forward. This is followed by a description of year 1 participation—including the issues of whether the demonstration was able to retain its original participants. Finally, we describe the characteristics of participating practices in each site and overall, in terms of size, geographic environment, affiliation with larger organizations, and participation in other quality improvement or EHR programs.

A. Community Partner Experience

The community partner in each site served as the recruitment arm for the demonstration and represents diverse collaborations of organizations (such as the South Dakota ehealth Collaborative or the Louisiana Health Care Quality Forum) representing local stakeholders (such as medical societies or other physician professional organizations), large payers, public entities (such as the Maryland Health Care Commission and the South Dakota Department of Health), and other health care organizations interested in advancing health IT use. The community partners were valuable for (1) providing an overview of site-specific context (as was described in Chapter I), (2) commenting on potential roadblocks or difficulties for the demonstration, and (3) describing the recruiting experience, which helps us understand the applicability or limitations in generalizing the demonstration experience outside the demonstration practices.

1. Recruitment Experience

Details the community partners shared about their recruitment give us insight into how the demonstration practices may be similar to or different from other small practices nationally in ways that might be hard to quantify but might matter when interpreting demonstration findings.[13]

It appears that the demonstration may have been disproportionately successful in recruiting practices affiliated with hospitals and health systems. To recruit practices, community partners leveraged hospitals and health systems, and worked with other membership organizations, such as the medical society or the rural health association. The health systems and hospitals were very helpful, according to the community partner staff we interviewed, and were often very successful in bringing their affiliated practices onboard. It may be that health systems and hospitals regarded participation in the demonstration as potentially cost-effective, since they could leverage central health IT support staff and have a larger resource base to cover any up-front costs to make changes to better meet demonstration measures, and at the same time the potential total financial reward to the system is larger, across several participating practices. The independent practices were much less likely to be responsive to outreach and more difficult to convince to participate in the demonstration.

[13] Due to staff turnover at the community partner, recruitment details were not available for one site.

In addition, the demonstration may have been successful primarily in recruiting practices that were further along than many others in their knowledge about and acceptance of EHRs. The community partners reported that the practices that tended to apply were those that already had an EHR, had made the decision to adopt one, or were close to making that decision. One community partner representative commented she had believed practices were closer to embracing EHRs than they actually were: "A lot of practices weren't even thinking about it, it wasn't on their radar."

2. Comments on Potential Difficulties or Roadblocks for the Demonstration

The comments from the community partners about the difficulties the demonstration may face are important because they are knowledgeable about the broad set of demonstration practices in their site, not just the narrower slice provided by our site visits. The main worries that the community partners expressed centered on four topics: the potential to lose some practices that do not have the interest or energy to implement EHRs, demonstration reporting requirements, transparency in terms of how adoption of certain EHR functions will affect the incentive, and fit with the other ongoing initiatives.[14]

Lack of interest or energy among some practices for EHR implementation. One community partner reported that when its staff made calls to remind practices about the OSS, a handful of treatment group practices said it is not "worth it" to implement an EHR at this time even with the Medicare and Medicaid EHR Incentive Program incentives as well as the demonstration incentives. In addition to cost and other barriers discussed elsewhere in this report, small practices have difficulty making time available so staff can train to implement an EHR, the community partners learned. One respondent commented that the recession may be accentuating this difficulty, as visits and procedures have dropped some, affecting practice revenues and causing the physicians to have to work harder to keep revenue stable. The Pittsburgh Regional Healthcare Initiative suspects this is a reason that the demand for available and free EHR assistance services has been slim to date. Another community partner reported difficulty gaining good attendance at educational webinars it has offered. On the other hand, there is hope that the coming months will increase attention and enthusiasm for implementation due to both the beginning of the second year of the demonstration, and the approach of the Medicare and Medicaid EHR Incentive Program incentives.

Reporting requirements and vendor role. Practices are reportedly concerned about how they will report the data for the demonstration. "There are lots of questions about how their reporting is going to be done, and that is detracting from the focus on outcomes," one community partner representative reported. While practices are being told to work with their vendors, there is concern that vendors won't have time enough to help them because so much of vendor activity is geared toward preparing for the Medicare and Medicaid EHR Incentive Program. Another community partner suggested that because clinics do not all use the same software, the level of help they receive may vary, depending on which vendor they have chosen. "There needs to be a group that knows how software works and can help all practices" to make sure that the

[14] We also heard each of these concerns during our site visits.

differences in how much help the vendors give do not result in differences in practices' ability to report and get incentives.

Transparency of incentive and incentive design. One community partner wants to be able to write articles such as "what electronic prescribing can do for you" that include information about how much adoption of e-prescribing could be worth to practices participating in the demonstration. However, the respondent noted that it is not clear enough at present how the criteria for the demonstration incentive payment are applied to be able to estimate that. Another wondered if the lower amounts of incentives in the first two years of the demonstration will be enough to keep participating practices motivated.

Fit with ongoing initiatives. One respondent thought that if EHRD reporting requirements are not well-aligned with the Medicare and Medicaid EHR Incentive Programs, and both sets are burdensome, reporting to the demonstration may "go by the wayside" because of the all-or-nothing nature of the latter program's requirements and incentives. Another respondent observes, "There is an awful lot going on, and trying to get the physician community aware of everything that is going on is large and hard to do." The long list of initiatives described in Chapter I seems to confirm that point.

B. Year 1 Participation

The demonstration began with 412 practices that were randomized into the treatment group. CMS later found 7 of them did not meet the terms and conditions of the demonstration, so they were terminated from the demonstration. Over the year, 9 percent of the randomized practices voluntarily withdrew, and a small additional number closed or merged with other practices, for a total of 12 percent lost to the demonstration in its first year (Table II.1).

Of the 363 practices that remained, about 45 percent (165 practices) either did not complete the OSS (25), did not have an EHR (101), or had an EHR but otherwise did not meet minimum requirements to be eligible for payment in year 1 (39) (Table II.2). To remain in the demonstration, these practices must be using a certified EHR for minimum required functions by the end of demonstration year 2. Of note, 16 of these practices reported they had no plans to implement an EHR within 12 months. The others that did not have an EHR at the time of the survey were planning to implement one either within 12 months or on an uncertain timeframe.

To try to minimize the number of practices lost because they did not implement a certified EHR or did not use it for the minimum functions, CMS gave lists of these at-risk practices to the community partners in hopes they will link the practices to resources necessary to implement EHRs and meet demonstration requirements.

Table II.1. Lost Practices, End of Demonstration Year 1

	All Four Sites	Louisiana	Maryland	Pennsylvania	South Dakota
Enrolled in the treatment group at demonstration start (June 2009)	412	104	127	138	43
Number of Nonparticipating Practices Per Site Lost to Demonstration					
Failure to meet terms and conditions	7	2	0	0	5
Voluntarily withdrew	37	15	12	9	1
Closed	3	0	0	3	0
Merged	2	1	1	0	0
Percent of original participants lost	12	17	10	9	14
Remaining participants June 2010	363	86	114	126	37

Table II.2. Number of Participating Practices Not Meeting Minimum Requirements for Incentive Payment Eligibility, End of Demonstration Year 1

	All Four Sites	Louisiana	Maryland	Pennsylvania	South Dakota
Number of participating practices	363	86	114	126	37
Did not complete OSS	25	12	6	7	0
Completed OSS and:					
Did not use EHR at all	101	29	29	30	13
Did not use EHR for clinical notes	19	2	4	12	1
Did not record or enter laboratory orders	28	2	7	16	3
Did not record or enter imaging orders	31	7	6	15	3
Did not record or enter prescription medications	4	0	3	0	1
Did not enter laboratory results	7	3	3	0	1
Did not enter imaging results	13	4	6	2	1
EHR not certified	18	1	2	14	1
Total number that completed OSS and used an EHR but did not meet minimum requirements	39	8	11	17	3

Of the 37 voluntary withdrawals, 24 never submitted their terms and conditions for the demonstration—they apparently decided against participating as the program began. Of the remaining 13, we learned the reasons for withdrawal from 10 of them (most often physician decisions or organizational changes):

- The physician members of the practice did not want to implement an EHR, are advanced in age, and/or will probably retire if/when EHRs are mandatory (2 practices).
- Physician "did not agree with" the demonstration, or "had a change of heart" about participating in the demonstration (further details not available) (2 practices).
- Physicians at the enrolled practice left the organization, or no primary care physician currently practices at the enrolled practice (2 practices).
- Practice changed ownership (2 practices).
- New leadership in place in the larger organization that owns the practice (1 practice).
- Demonstration was perceived as too cumbersome for a solo practitioner (1 practice).

Another potentially important issue is whether participating practices are engaged in the demonstration and poised to respond to its incentives. Unfortunately, most practices seemed only vaguely aware of the features of the demonstration, such as the year-to-year participation requirements and the quality measures that would ultimately be incentivized. At the time of our visits, only 5 of 16 visited treatment group practices reported being influenced to take any actions as a result of their participation in the demonstration in the first year. Two were part of a large group that was rolling out EHRs to all its practices and moved practices assigned to the treatment group up in the schedule. A solo practitioner said the demonstration sped up his process of acquiring and implementing an EHR, and a fourth said participation had underscored the importance of having an EHR and what will be expected for accountability, reporting, and disease management. The fifth practice's administrator was using demonstration kick-off materials including the OSS as her "bible" for planning better use of the EHR system.

C. Characteristics of Treatment Group Practices

The profile of the treatment group practices in each site varied widely in terms of their environment, practice affiliation, and participation in other quality improvement, EHR, and pay-for-performance programs; their principal commonality is that they are all small to medium-sized practices, with the vast majority having fewer than 10 practitioners. Because the evaluation uses an "intent-to-treat" approach, the figures provided in the rest of this chapter include data from both participating and non-participating treatment group practices.[15]

[15] Non-participating treatment group practices included in the analysis are those that were randomized to the treatment group but have since voluntarily withdrawn from the demonstration. Treatment group practices that closed or merged with another treatment group practice prior to completing the Office Systems Survey are not included in the analysis. Participating practices are treatment group practices that have not closed, merged, or withdrawn from the demonstration.

1. Louisiana

Nearly half of Louisiana's treatment group practices are located in a HRSA-designated MUA, far more than in the other sites. Also very different from other sites: fully 70 percent of Louisiana's treatment group practices were not participating in any other quality improvement, EHR, or pay-for-performance program at the time of the OSS. In other respects, Louisiana's practices were similar to the average across all sites: 20 percent are rural, about two-thirds are unaffiliated with a larger organization, and most had more than 200 chronically ill FFS Medicare beneficiaries in the practice.

2. Maryland and District of Columbia

The Maryland and District of Columbia site's largely urban treatment practices were less often in an MUA than practices in Louisiana or Pennsylvania, but otherwise generally reflected the average characteristics across sites. Nearly three-fourths were unaffiliated with any larger organization, and more than 40 percent were not participating in any other relevant program. Only 5 of this site's 114 participating treatment practices are located in the District of Columbia.

3. Southwestern Pennsylvania

Like Maryland, Pennsylvania's treatment group practices are largely urban, with 30 percent located in MUAs. These practices tended to have relatively lower numbers of Medicare FFS beneficiaries (28 percent of the practices had fewer than 200 in total). Smaller practices would be expected to have lower numbers of Medicare beneficiaries, and of the four sites Pennsylvania has the lowest percentage of practices with 6 or more physicians. Also, the number of Medicare beneficiaries is influenced by practice specialty, whereby family practitioners tend to serve fewer Medicare beneficiaries than do internists.[16] Pennsylvania practices were far more likely to be owned by a hospital, hospital system, or integrated delivery system than practices in other states (57 percent), and they were more likely to be involved in other related programs, with almost three-fourths participating in private-sector quality improvement or pay-for-performance programs, and nearly two-thirds participating in PQRS.

4. South Dakota

South Dakota has a much larger portion of practices with 6 or more physicians than other sites (47 percent), and along with that came relatively high Medicare caseloads: more than half the practices reported 1,000 or more Medicare FFS beneficiaries. South Dakota also has by far the most rural environment for the demonstration: 71 percent of its treatment practices are located in rural areas. South Dakota practices were relatively involved with other programs, with 58 percent participating in private-sector quality improvement or pay-for-performance programs and two-thirds participating in PQRS.

[16] We have not specifically confirmed the role of specialty in this particular case.

Table II.3. Characteristics of Treatment Group Practices Completing the OSS (in percents)

Practice Characteristics	All Sites (n=352)	Louisiana (n=79)	Maryland (n=111)	Pennsylvania (n=124)	South Dakota (n=38)
Practice Size (total number of providers)[a]					
1-2	44	47	42	46	34
3-5	35	33	35	41	18
6-10	15	13	15	10	34
>10	6	6	7	3	13
Percent in an MUA[b]	28	47	17	30	16
Percent in a Rural Area[b]	16	20	5	6	71
Number of Assigned Medicare FFS Beneficiaries[c]					
0-199	45	39	33	62	34
200-999	47	56	54	35	47
1000 or more	8	5	13	3	18
Practice Affiliation[a]					
Unaffiliated	57	68	73	31	71
Owned by a larger medical group	5	0	8	5	3
Owned by a hospital, hospital system, or integrated delivery system	32	19	17	57	18
Affiliated with an IPA or PHO and not owned by a larger entity	5	9	0	7	5
Other affiliation	2	4	2	1	3
Participation in Other Quality Improvement, EHR, and Pay-for-Performance Programs[a]					
No participation	34	70	43	11	18
Private-sector quality improvement program(s) including pay-for-performance	39	3	17	73	58
PQRS	50	22	48	63	66
Other	17	9	19	21	18

IPA = independent practice association; PHO = physician hospital organization

[a] Source: Office Systems Survey. Percentages are of those responding to the relevant question.

[b] Source: Randomization information (done by linking geocoded addresses to data from HRSA's website)

[c] Source: Year 1 Medicare claims data, assignment determined by the demonstration's implementation contractor.

[d] This question was open-ended. Although most practices responded by filling out a number of FFS patients they serve, some provided the proportion of their patients that are FFS. For example, one practice responded that 25 percent of its patients are FFS.

D. Health IT Use

According to results from the OSS, a majority of practices adopted a CCHIT-certified EHR, utilized basic EHR functions, and met the minimum requirements to receive a systems payment. However, the degree to which practices used functions, especially advanced functions, varied. In this section we detail the adoption and use of EHRs by treatment group practices that completed a year-1 OSS.

1. Health IT Adoption and Technical Assistance

EHR adoption by site. Among demonstration participants, the percentage that are using an EHR has risen sharply from 45 percent at the time of their application in Fall 2008 to the demonstration, to 65 percent at the end of year 1 (about an 18-month period). Pennsylvania practices showed the largest increase, rising from 44 percent using an EHR at demonstration start, to 71 percent at the end of year 1, while Louisiana practices showed the least progress, with a rise from 41 percent to 52 percent using an EHR. Note that the pace of adopting an EHR will need to further increase this year (more than double) if all the practices are to remain in the demonstration after the end of year 2.

Table II.4. Adoption of EHRs Among Demonstration Participants

	All	Louisiana	Maryland	Pennsylvania	South Dakota
Number of Participating Practices	363	86	114	126	37
Percent that Had an EHR at Time of Application to the Demonstration	45	41	52	44	41
Percent Using an EHR, End of Year 1	65	52	69	71	65

Source: Application data, Year 1 OSS

Note: 25 practices did not respond to the year 1 OSS, so their use of an EHR at present is unknown (we suspect most do not have an EHR). These practices are included in the denominator for the percent using an EHR, end year 1.

EHR adoption, as reflected by the treatment group practices' first-year OSS responses, varied across sites, with the highest rate of use reported at Pennsylvania practices (74 percent) and the lowest rate in Louisiana (57 percent) (Table II.5). Overall, 68 percent of practices have adopted an EHR system. Regarding other health IT, practices seldom reported using stand-alone registries (not linked to their EHR). Stand-alone e-prescribing systems were much more popular, used by 37 percent of all practices and 54 percent of Pennsylvania practices.

Use of technical assistance. Many practices reported receiving technical assistance for adoption of EHR or health IT. More than 80 percent of practices in most sites received assistance, but Louisiana practices lagged behind; only 64 percent reported receiving help from any source. The source of technical assistance varied across sites, but overall, practices were most likely to report receiving assistance from an EHR vendor (72 percent) or a larger organization that owned the practice (44 percent). Compared to other sites, Maryland practices utilized more assistance from a private consultant, Pennsylvania practices received more assistance from a larger organization owning the practice, and South Dakota practices relied heavily on EHR vendors.

Table II.5. Year 1 Health IT Adoption and Technical Assistance in Treatment Group Practices Who Completed the OSS[a] (percentages, unless otherwise noted)

Practice Characteristics	Louisiana	Maryland	Pennsylvania	South Dakota	All Sites
Practice Uses EHR	57	71	74	63	68
Other Systems Implemented					
Stand-alone e-registry	6	2	3	0	3
Stand-alone electronic prescribing system	22	38	54	7	37
Practice Using an EHR Received Technical Assistance for Adoption of EHR or Health IT					
Yes	64	80	88	91	81
No	36	20	12	9	19
Practice Receiving Technical Assistance Received it from					
EHR vendor	69	76	67	86	72
Private consultant	10	30	6	14	16
Larger organization that owns this practice	34	30	67	14	44
Other[b]	21	30	10	14	19
Number of Responses[c]	79	111	125	38	353

Source: Year 1 OSS.

[a] Includes both participating practices and practices that withdrew from the demonstration.

[b] Includes DOQ-IT University, Quality Improvement Organization (QIO), or health IT adoption or e-health initiative.

[c] The Number of Responses is the number of practices that completed an OSS. The number of responses varies by item.

2. Use of EHR Functions

Most practices reported using their EHR systems to perform core functions—that is, those that are minimally required for scoring. These were: (1) having a certified EHR, (2) recording visit notes, (3) recording diagnostic test orders, (4) recording diagnostic test results, and (5) recording prescriptions. Of the practices that continued to participate in the demonstration through June 2010, completed an OSS, and had an EHR (N=237), 84 percent of them met all the minimum EHR requirements to receive a systems payment, including recording patient visit notes, recording diagnostic test orders and results, and recording prescriptions. However, the regular use of more advanced functions was not widespread, as discussed more below.

OSS summary scores. OSS summary scores measure EHR use overall and in each of five "domains" as described in Table II.6. EHR use varied considerably by domain. While the overall average summary score was 59 percent, the mean scores by domain ranged from 32 percent (use of system to increase patient engagement and adherence) to 80 percent (completeness of information). On average, practices also scored high in the medication safety domain (77 percent), and scored moderately in the communication of care outside practice and clinical decision support domains. Appendix A, Section 4 provides average OSS scores by domain by site.

Table II.6. EHR Functions Associated with the Five OSS Domains

Domain	Functions	
Completeness of Information	• Paper records transitioned to the EHR system • Paper charts pulled for recent visits • Method to transition paper records • Clinical notes for individual patients • Allergy lists for individual patients • Problem/diagnosis lists for individual patients • Patient demographics • Patient medical histories • Record that instructions/educational info were given to patients	• Record/enter new prescriptions and refills • Record/enter lab orders • Scan paper lab results • Review lab results electronically • Record/enter imaging orders • Scan paper imaging results • Review imaging results electronically
Communication about Care Outside the Practice	• Print/fax lab orders • Fax lab orders electronically from system • Transmit lab orders electronically directly from system to facility with capability to receive • Print/fax imaging orders • Fax imaging orders electronically from system • Transmit imaging orders electronically directly from system to facility with capability to receive • Transfer electronic lab results (received in non-machine-readable format) directly into system • Enter electronic lab results manually • Receive electronically transmitted lab results directly into system • Transfer electronic imaging results (received in non-machine-readable format) directly into system	• Enter electronic imaging results manually into electronic system (whether received by fax, mail, or phone) • Receive electronically transmitted imaging results directly into system • Enter requests for referrals/consultation • Transmit med lists/info • Transmit lab results (machine-readable) • Transmit imaging results (machine-readable) • Receive electronically transmitted reports directly into system • Print prescriptions, fax to pharmacy/hand to patient • Fax prescription orders electronically from system • Transmit prescription orders electronically directly from system to pharmacy with capability to receive
Clinical Decision Support	• Enter clinical notes into templates • View graphs of height/weight data over time • View graphs of vital signs data over time • Flag incomplete/overdue test results • Highlight out-of-range test levels • View graphs of lab/test results over time • Prompt clinicians to order tests/studies • Review and act on reminders at the time of the patient[a] encounter	• Reference info on medications • Reference guidelines when prescribing • Search for or generate a list of patients: - requiring a specific intervention - on a specific medication - who are due for a lab or other test - who fit a set of criteria (age, for example)
Use of the System to Increase Patient Engagement/ Adherence	• Manage telephone calls • Exchange secure messages with patients • Patients view records online • Patients update info online • Patients request appointments online (not scored) • Patients request referrals online (not scored) • Produce hard copy or electronic reminders for patients[a] about needed tests, studies, or other services	• Generate written or electronic educational info to help patients[a] understand their condition or medication • Create written care plans to help guide patients[a] in self-management • Prompt provider to review patient self-management plan with patienta during a visit • Modify self-management plan as needed following a patienta visit • Identify generic or less expensive brand alternatives at time of prescription entry • Reference drug formularies to recommend preferred drugs
Medication Safety	• Maintain medication list • Generate new prescriptions • Generate prescription refills • Select medication (from a drop-down list, for example)	• Calculate appropriate dose/frequency • Screen prescriptions for drug allergies, drug-drug interactions, drug-lab interactions, and drug-disease interactions

Source: Year 1 OSS (see Appendix A).

[a] Diabetes, coronary artery, congestive heart failure, and preventive care patients.

Influence of practice characteristics. OSS scores do not seem to be linked closely to the practice characteristics of size, location, and affiliation (Table II.7). The one characteristic that may play a role in helping practices fully implement EHRs is their participation in quality improvement initiatives. The mean score for practices that reported current participation in such a program is significantly higher overall and in three of the five domains, compared to those that reported no participation. This finding supports the common wisdom that EHRs can be and sometimes are being used as a key tool—by practices interested in improving quality—to support care management improvements.

Table II.7. Year 1 OSS Summary Scores by Practice Characteristics, for the 198 Treatment Group Practices that Met the Minimum Requirements to be Scored

Practice Characteristics	Mean Weighted OSS Summary Score[b]	Mean Unweighted OSS Domain Score[a]				
		Completeness of Information	Communication of Care Outside Practice	Clinical Decision Support	Use of System to Increase Patient Engagement and Adherence	Medication Safety
OSS score (all practices)	59	80	52	53	32	77
Practice Size (total number of providers)						
1-2 physicians	59	80	52	51	31	77
3-5 physicians	58	77	50	52	32	75
6+ physicians	62	83	55	57	33	76
Whether in a Medically Underserved Area[c]						
Yes	60	79	50	53	32	79
No	59	80	53	53	32	75
Whether in a Rural Area[d]						
Yes	61	81	51	56	31	80
No	59	80	52	53	32	76
Practice Affiliation						
Affiliated[d]	60	80	51	53	33	79
Not affiliated	59	80	53	54	31	74
Practice Currently Participating in Programs						
Any program[e]	61*	82*	53	56*	34*	78
None or Don't Know	55	75	49	45	27	73

*Significantly different p<.05.

Source: Year 1 OSS. Also, randomization data and data from the practice applications, where noted.

Notes: Minimum requirements for scoring were: (1) having a certified EHR, (2) recording of visit notes, (3) recording of diagnostic test orders, (4) recording of diagnostic test results, and (5) recording of prescriptions.

N= 198 practices that completed an OSS and met the minimum requirements to be scored. The number of responses varies by item.

[a] See Table II.6 for function-specific items covered in each domain, or reference the OSS instrument in Appendix A, Section 1 for additional detail).

[b] The weighted OSS summary score reported here is a weighted total of the scores by domain (see Appendix A, Section 2 for weighting methodology). It does not include the additional 3 points that were awarded when practices were using a currently certified EHR.

[c] Source: Randomization information (done by linking geocoded addresses to data from HRSA's website).

[d] Includes affiliation with IPA; PHO; community health center; academic medical center; owned by a hospital, hospital system, or integrated delivery system; owned by a larger medical group; or, has some other affiliation.

[e] Includes PQRS; Bridges to Excellence; state or regional public reporting group; other private sector EHR demonstrations or initiatives; other federal quality improvement initiatives, including pay for performance; state or other publically funded quality improvement initiatives including pay for performance or Medicaid IT initiatives; private quality improvement initiatives, including pay for performance; or other similar programs.

3. Use of Specific Functions

The following is a summary of practices' use of specific functions within each domain. It is based on a larger sample that includes all practices that completed an OSS and implemented some sort of an electronic tool (an EHR, an electronic patient registry, or an electronic prescribing system). Of the 276 practices, 36 had a stand-alone electronic prescribing system or stand-alone electronic patient registry, but did not use an EHR.[17] The reasons why practices may use some functions and not others include: (1) system capabilities—not all EHR systems are capable of performing all functions, and as noted above, some of these practices did not have full EHR systems; (2) practice priorities during transition to an EHR—many may prefer to keep initial transition to the EHR as simple as possible, intending to add other functions over time; and (3) customary style of practice, shaped by FFS payment system features—patient-centered care management functions such as developing care plans and providing education may take more time to implement and FFS payment does not reimburse physicians for that time.

The summary below is based on the detailed responses for each of the functions queried by the OSS, provided in Appendix A, Section 3.

Completeness of information. Overall, practices reported frequent use of their systems to perform many of the functions related to maintaining different types of patient data. More than half responded that they transitioned three-quarters or more of paper records into the EHR system. However, more than one-third reported they still scan paper versions of laboratory and imaging results into the electronic system (39 percent and 47 percent, respectively) for three-quarters or more of their patients.

Communication of care outside the practice. Practices reported low levels of interoperability and communication of clinical information with other providers. In an interoperable environment, clinical orders and results would flow between providers in machine-readable form. However, 68 percent of practices said they never sent laboratory orders as machine-readable data, and 82 percent never sent imaging orders as machine-readable data. The news was somewhat better for prescription orders, where 42 percent of practices (117 practices) routinely sent machine-readable prescriptions to pharmacies that have the capability to receive such transmissions, with most using their EHR's e-prescribing function (89 percent of the 117) rather than using a stand-alone e-prescribing product.[18] One-third of practices routinely used their EHR systems for managing referrals to other providers (recording the referral request, scheduling the referral/consultation, and tracking the results of it).

Clinical decision support. Fewer than one-third of practices using health information technology routinely used the following clinical decision support functions (that is, they did not use them or used them for fewer than three-fourths of the relevant patients): flag incomplete or

[17] The fact that 36 practices did not have an EHR meant that they would not have had an opportunity to use many of the queried electronic functions, thus the percent of these practices who used each function will be lower than if only those who had the opportunity to use it were included. Note that this would be the case even if they were removed from the sample, since not all EHR systems may have the capability to perform every function queried.

[18] Only 3 percent of the 117 practices used a stand-alone eprescribing product that was not linked to an EHR system.

overdue test results; view graphs of laboratory or other test results over time for individual patients; prompt clinician to order necessary tests, studies, or other services; reference guidelines and evidence-based recommendations when prescribing medication for a patient; and regularly search for lists of patients based on various criteria (e.g. those requiring a specific intervention). More than half of practices enter patient information into documentation templates routinely, and more than half regularly use their system to review and act on reminders at the time of an encounter with diabetes or preventive care patients. However, use of reminders at the time of an encounter is much lower for patients with other queried conditions, such as congestive heart failure. Use of their systems to view graphs of patient height or weight or vital signs data over time is relatively common (45 and 47 percent of practices reported using this function routinely).

Use of system to increase patient engagement and adherence. In terms of increasing patient engagement and adherence (which had by far the lowest average score of the five OSS domains), problem areas included electronic interfaces with patients, and infrequent use of the system to generate, review and modify a care plan to help guide chronically ill individuals in self-management. In addition, only 28 to 35 percent of practices (depending on the condition) used their systems to provide reminders to most of the relevant chronically ill patients for needed tests or services.

Medication safety. Practices consistently used their systems for a variety of functions related to ensuring medication safety. More than 75 percent of practices used the system to perform the following functions for at least three-quarters of patients during the past year: maintaining a medication list for individual patients, generating new prescriptions and refills, selecting individual medication for prescription (from a drop-down list, for example), or screening prescriptions for drug allergies and drug-drug interactions. Fewer than one-quarter of practices reported frequent use of their system to check drug-laboratory or drug-disease interaction. Although only 38 percent of practices reported frequent use of their system to calculate appropriate dose and frequency, discussions with physicians during site visits suggest that this function is more frequently used in pediatric care.

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III. HEALTH IT PROGRESS, ISSUES, AND CONCERNS

The main goal of the evaluation of the EHR demonstration is to estimate the impact of providing financial incentives to small and medium-sized physician practices to adopt and advance EHR use and improve the quality of care for chronically ill Medicare beneficiaries. To this end, it is important to understand (1) how practices involved in the demonstration implemented and used EHRs in the first year of the demonstration, (2) how practices expect to use EHRs and other health IT to improve care management in the future, and (3) whether there were differences in implementation and use of EHRs between visited control and treatment practices.

In the first year of the demonstration, it appeared that visited treatment and control practices were at about the same level of adoption and use of EHRs, and were largely influenced by the shift in the medical community toward adoption of health IT. More than half of the visited treatment and control practices were using EHRs at the time of the visits, and many of the practices without an EHR expected to adopt one in the coming year. In this chapter, we first describe the extent of adoption and use of health IT among the visited treatment and control practices, including the current status of and future plans for using health IT. Second, we detail the changes practices made to workflow and staffing in the wake of EHR implementation. Third, we discuss the experiences of interviewed practice staff with EHR features, both in terms of those that were perceived to support clinical care and those viewed as problematic. Finally, we elaborate on barriers to adoption and use of EHRs among visited practices with and without EHRs.

A. Adoption and Use of Health IT

At the time of the site visits, the majority of visited treatment and control practices had adopted EHRs with the help of external support and were interested in their ability to improve care and office workflow. Most of these practices were using the more basic EHR functions, such as recording notes, diagnostic test orders, and prescriptions, and expected to customize and increase EHR use in the future.[19] All but two of the treatment and control group practices without an EHR expected to adopt one in the next year.

1. Current Status of Health IT Adoption Among Treatment Practices

Use of EHRs. At the time of the site visits, use of EHRs was widespread. Three-quarters of treatment practices (12 of 16) reported that they had adopted EHRs, and they ranged from solo practitioners to one group practice with 14 physicians. Of these, 7 treatment practices reported that their current EHR system had been in place for more than one year, although they were at various stages of implementation. Four treatment practices were early adopters of EHRs and had been using their system for three or more years. A variety of EHR products were used across

[19] Types of EHR customizations include: streamlining the data entry process such that, at the time of a patient visit, the physician must only complete relevant templates and/or fields in the template, updating health maintenance templates to include diagnostic tests for chronic conditions, and adding alerts and reminders for needed preventive services and diagnostic tests.

treatment practices. One treatment practice reported it had implemented a second EHR system in the last year, having been dissatisfied with the technical support (or lack thereof) provided by the first EHR vendor; it was hoping for improved support from the new one, including quicker response to requests for help.

Basis for EHR adoption decision. The treatment practices that adopted EHRs in the last three years saw that the practice of medicine was moving toward greater use of EHRs and wanted to get ahead of the curve. They did not appear to be influenced in their adoption of EHRs by the EHR demonstration or other upcoming federal incentive programs (such as the Medicare and Medicaid EHR Incentive Program)[20] or by state-level programs, although they expected to receive incentives for using the minimum set of EHR functions under the EHR demonstration.[21] Practices that adopted EHRs in the past three years followed a variety of methods to decide upon an EHR system, including steering committees at several practices associated with larger medical groups (composed of physicians, office administrators, and chief information officers, among others) (2 practices); and site visits, system test-runs, and vendor presentations (4 practices). Three treatment practices also decided to adopt EHRs to promote interoperability with the associated hospital system and, if associated with a larger group, other practices. Another motivator was the potential of the systems to improve care coordination, including the ability to do e-prescribing (1 practice) and produce alerts and reminders (1 practice).

Technical assistance and support. The availability of technical assistance was a main reason for satisfaction (or dissatisfaction) with EHRs. As previously mentioned, one treatment practice recently switched to a different system to receive more immediate assistance. All but two of the other visited treatment practices reported a variety of sources of technical assistance and support, including an IT consultant (3 practices), technical assistance from the EHR vendor (3 practices), and staff from the corporate IT department (3 practices). In addition to this support, IT consultants and EHR vendors conducted initial training sessions at 8 of the visited treatment practices to ensure a basic usability level. At the time of the site visits, 7 treatment practices reported that they received ongoing technical assistance from EHR vendors, consultants, and corporate IT departments to help with day-to-day issues with their EHR systems. For example, one treatment practice stated it relies on vendor representatives to solve issues with interruptions in communication between the EHRs and the vendor's server (housed outside the practice). Another treatment practice that implemented the EHR without outside help found the implementation process quite overwhelming and now relies on vendor representatives to provide support on various aspects of the EHR, including the process of transferring paper charts to the electronic system and how to use the system's clinical functions.

Use of EHR functions. The 12 visited treatment practices with EHRs reported using at least some of the minimum functions required to receive the year 1 system payment (recording

[20] In total, 8 treatment practices with EHRs were aware of the Medicare and Medicaid EHR Incentive Program and were expecting to be eligible to receive the financial incentives available under the program, although the timing of our visits was prior to the final Incentive Program rule, so their expectation must have been tentative at best.

[21] To be eligible to receive the EHR demonstration's year 1 system payment, practices must use a certified EHR and electronically record clinical notes, diagnostic test orders and results, and prescriptions.

of clinical notes, diagnostic test orders and results, and prescriptions) (Table III.1).[22] All of them reported in the year 1 OSS that they recorded clinical notes and prescriptions into the electronic system. Most treatment practices also acknowledged some ability to receive and order diagnostic tests; however, there was a wide range in the proportion of patients for which they could enter orders and results. For example, 7 of the visited treatment practices with EHRs reported they were able to electronically record laboratory orders for at least three-quarters of patients; 2 reported they could electronically record laboratory orders for fewer than one-quarter of patients. As discussed in Section III.C.2, the visited practices cited several reasons for this variation in use of the diagnostic test features in the EHR, including the cost of connecting with outside laboratories and interoperability issues.

Table III.1. Use of Minimum EHR Functions Among the 12 Visited Treatment Practices with EHRs

EHR Function	Number of Treatment Practices
Using clinical notes	11
Recording/entering laboratory orders	10
Recording/entering imaging orders	9
Entering laboratory results (by fax, mail, scanning, directly, or manually)	12
Entering imaging results (by fax, mail, scanning, directly, or manually)	11
Recording/entering prescription medications	12

Source: Year 1 EHRD OSS.

The visited treatment practices reported varying degrees of use of the more advanced EHR features. These included: using the EHR to generate educational materials for patients about their conditions and create care management plans; referencing prescription guidelines; viewing graphs of patients' diagnostic tests, height and weight, and vital statistics; using a patient portal or secure email with patients; and electronic communication (referrals and transmissions of records) with other providers. Nine of the visited treatment practices met the minimum criteria for scoring in year 1: they had a certified EHR and used it to record visit notes, diagnostic test orders and results, and prescriptions. However, the extent of use of functions in each of the scored domains (completeness of information, communication of care outside the practice, clinical decision support, use of system to increase patient engagement and adherence, and medication safety) varied widely, from low use to high (Table III.2).[23] For example, one practice received a score of 12 for the clinical decision support domain, while another received a perfect score of 100.[24] Essentially, this means that at the lower end of the spectrum the practice was not

[22] For example, electronic recording of laboratory test results ranged from the more basic use of the function—receiving laboratory results by fax or mail and then scanning the paper versions into the EHR—to the more advanced use—receiving electronically transmitted laboratory results directly into the EHR from facilities that are able to send such transmissions.

[23] The functions contained in each domain are listed in Table II.6.

[24] The clinical decision support domain includes entering information from clinical notes into documentation templates, viewing graphs of patient data, reviewing and acting on reminders at the time of a patient encounter, referencing information on medications being prescribed, and generating lists of patients.

using the EHR to view graphs of diagnostic test results over time, review and act on reminders, reference guidelines when prescribing medications, and generate lists of patients requiring specific interventions, fitting certain criteria, or requiring a specific diagnostic test. The mean overall OSS score for the nine practices was similar to that for all demonstration practices that met minimum requirements for scoring (62 vs. 59), and the means of the domain scores reflected the same general pattern as described in Chapter II for all demonstration practices, with the lowest mean score for use of the system to increase patient engagement and adherence.

Table III.2. Year 1 OSS Summary Scores for the Nine Visited Treatment Practices that Met the Minimum Requirements to be Scored

		Unweighted OSS Domain Score				
Practice	Weighted OSS Summary Score[a]	Completeness of Information	Communication of Care Outside Practice	Clinical Decision Support	Use of System to Increase Patient Engagement and Adherence	Medication Safety
1	38	63	25	12	9	78
2	45	72	33	21	18	78
3	51	69	29	59	30	67
4	59	78	38	64	42	72
5	62	75	26	71	59	78
6	70	92	43	79	53	83
7	70	92	58	75	43	78
8	70	92	58	75	43	78
9	89	100	69	100	71	100
Mean	62	81	42	62	41	79

Source: Year 1 OSS.

[a] The weighted total OSS score reported here is a weighted total of the scores by domain (see Appendix A, Section 2 for weighting methodology). It does not include the additional 3 points that were awarded when practices were using a currently certified EHR.

Note: Scores are out of a total of 100. Minimum requirements for scoring were: (1) having a certified EHR, (2) recording visit notes, (3) recording diagnostic test orders, (4) recording diagnostic test results, and (5) recording prescriptions. Three of the visited treatment practices had EHRs, but did not meet the minimum requirements. Four of the visited treatment practices did not have EHRs.

Use of stand-alone registries. An electronic patient registry brings together and uses key information for the set of patients with a certain chronic condition (or those needing preventive services) to support better care. Registries can be used to view trends in patient outcomes or biological markers of the condition (such as cholesterol levels), identify patients overdue for specific therapies, facilitate prompt ordering of specific laboratory tests or recommended drugs, and facilitate prompt communication with patients requiring followup. Only one treatment practice reported using a stand-alone registry. While this practice has used an EHR system for more than three years, it did not have an integrated registry and saw the need for a registry of some type in order to participate in two initiatives—the PQRS, and a patient-centered medical home project through the National Committee for Quality Assurance (NCQA). However, the initiatives have different reporting requirements so the practice uses two separate stand-alone registries to record and report quality process-of-care measures. Several other visited practices use functions in their EHR for the same purposes, such as producing lists of patients needing

services for follow-up. This is roughly visible in their high scores on the clinical decision support domain (Table III.2).

Staff attitudes toward health IT. In general, interviewed staff (including physicians, nurses, medical assistants, and administrative staff) at the visited treatment practices reported that they and others at the practice were in favor of EHRs. Those at practices with EHRs were committed to learning how to effectively and efficiently use the EHRs to improve patient care and practice workflow. For instance, a physician interviewed at a treatment practice with an EHR noted that all physicians in the practice expected that the EHR would be able to improve care management and quality and they accepted the learning curve that accompanied implementation. Although there was a commitment to continued and improved EHR use at the practice level, interviewed staff at 4 treatment practices reported that staff found the EHR burdensome or were resistant to using the system. For example, while a physician interviewed at one treatment practice expressed some frustration and had complaints about the usability of the EHR system, he also realized that the EHR was necessary to the practice (for better documentation and management) and looked forward to improvements to the efficiency and usability of the system. A physician interviewed at another treatment practice said the conversion from paper to electronic records was time-consuming but he viewed the temporary reduction in productivity as inevitable.

2. Future Plans for Use of Health IT at Treatment Practices

Updates to EHR systems. All of the visited treatment practices with EHR systems expressed interest in customizing them for better use of care management functions, including: (1) creating reports to track patients with chronic conditions (2 practices); (2) creating patient portals, where patients could view their medical records and request appointments, referrals, and prescription refills (2 practices); and (3) improving interoperability with other systems, including hospitals and laboratory and imaging vendors (4 practices), so test results could be tracked more easily. In addition, several practices were interested in more optimally using existing templates, including one treatment practice that planned to start using a health management template, and another that was creating a template specific to patients with heart disease. In our interviews with staff, it was apparent they expected use of care management functions to increase incrementally, depending on both system upgrades and the perceived need for these functions. While 8 treatment practices appeared to be aware of the emphasis on meaningful use of EHRs, only 3 of them were motivated by the announcement of the Medicare and Medicaid EHR Incentive Program to improve their use of EHR functions by the time of the visits, which occurred prior to the issuance of the final rule for the incentive program.

Some of the envisioned updates to the EHR systems were more operational in nature. One treatment practice wanted to improve the functionality of the EHR so it would be more user-friendly, while a second treatment practice was more focused on standardizing how the EHRs were used (how data was entered) by physicians and other practice staff. A third treatment practice was committed to scanning in all paper charts and completing the transition from partially to fully electronic. Several treatment practices were interested in "canned" or "quick" text entry features, which would enable staff to type in a few letters or a shortcut phrase to find desired data (such as medication history or a test result).

One treatment practice reported it was in the process of adopting another system. This practice was the first in its associated larger medical group to adopt the EHR system, and was testing the features before the system was rolled out to the other practices in the medical group.

New adoption of EHRs. All except one of the four treatment practices without an EHR were committed to adopting one in the next year. The three practices were looking for systems that were easy to use and affordable, and were making their purchase decisions by: (1) creating a steering committee (1 practice), (2) testing systems (1 practice), (3) conducting site visits (1 practice), and (4) attending vendor demonstrations (1 practice). In addition, the three practices appeared to be influenced by the EHR demonstration, which requires adoption and use of minimum functions in the EHR by the end of the second year of the demonstration. The practices did not appear to be influenced by other EHR initiatives at the federal and state level; only one practice expected that the incentives offered through the Medicare and Medicaid EHR Incentive Program would facilitate acquisition of the EHR.

No change. One treatment practice that did not have an EHR at the time of our site visits reported it was not considering adopting an EHR. The solo physician at this practice in rural Pennsylvania had previously expected that participating in the demonstration would enable him to acquire an EHR but he learned the incentives would not cover costs of the system. This, combined with declining revenue at the practice, led him to decide not to adopt an EHR.

3. Adoption and Use of Health IT Among Control Practices[25]

As with the treatment practices, more than half of the control practices (5 out of 8) reported that they had adopted EHRs at the time of the site visits, and the staff were largely accepting of the EHRs. Three of the control practices reported that their current EHR system had been in place for more than three years; one had been using its system for more than one year. One control practice had moved to a second EHR system to benefit from integrated e-prescribing, which was not included in the first system. Another control practice expected to switch in the next year to the EHR system used by the local hospital, largely to have better access to laboratory and imaging results. Two control practices without EHRs were committed to adopting an EHR in the next year; one was not, because of the expected labor and monetary cost of the EHR, issues with internet connectivity, and the advanced age of one of the physicians.

Control practices, like treatment practices, were influenced in their adoption of EHRs by the nationwide move toward health IT; 2 control practices were aware of the Medicare and Medicaid EHR Incentive Program. Technical assistance also played a large role for four of the control practices, which utilized the same types of support (IT consultant, vendor, corporate IT department, training) reported by treatment practices.

[25] In one site, we visited both treatment and control group practices owned by the same organization. Since this pattern occurs in the demonstration more generally, we aimed to gain insight into its potential implications for the evaluation. We found that the central health IT department of the larger organization was key to influencing EHR use in all owned practices similarly. We will be systematically assessing the extent to which treatment and control practices are owned by the same larger organizations and the implications for the evaluation when we begin quantitative analysis in 2012.

Although participation in the EHR demonstration was expected to result in improved use of EHRs and improved quality of care, it did not appear that, at least in the first year of the demonstration, participation caused EHR use to be any more advanced among visited treatment practices than control practices. Indeed, like their treatment counterparts, control practices reported varying levels of use of the minimum EHR functions. At the time of the site visits, the five control practices with EHRs reported that they recorded clinical notes and prescriptions electronically, but only some could record and receive diagnostic tests through their EHRs (3 practices could receive laboratory orders; 4 could receive imaging results). In the future, control practices expect to: (1) create patient portals (2 practices), (2) improve interoperability with other systems (1 practice), (3) print educational materials for patients (1 practice), and (4) use an integrated disease registry (1 practice). As with the visited treatment practices, control practices were investigating ways to customize their EHRs to help with care management, including improved interoperability with hospitals and laboratory and imaging vendors to enable more awareness of test results and reminders for test orders.

B. Changes to Practice Workflow and Staffing Due to Implementation of EHRs

Practices that implemented EHR systems within the three years prior to our site visits reported a few changes to practice operations, including workflow and staffing. The changes that occurred were more related to office routines, such as improved documentation, more efficient operations, and improved patient care. The EHRs were not yet being used to directly influence care coordination.

1. Changes Among Treatment Practices

Improved documentation processes. Interviewed staff at treatment practices were quick to mention that they were better able to document clinical notes, test results, and prescriptions with the EHR than with paper charts. Not only were charts more legible, they were also more complete, and physicians were able to easily review patients' charts prior to visits. Four treatment practices reported that medical assistants (MAs) are now responsible for documenting patients' vital and laboratory and imaging results, either at the time of the visit (for example, for blood pressure results) or after (for test results). One large treatment practice (14 physicians, 53 total employees) reported it had not only improved the volume of documentation, but also standardized the recording of medical, social, and family histories, as recommended by an EHR advisory committee composed of physicians, nurse practitioners, and administrative staff. Electronic dictation also played a role in improved documentation; two treatment practices lauded the ability of their EHR systems to accept electronic dictation through Dragon NaturallySpeaking©, which also made physicians more amenable to using the EHR systems and fully documenting their clinical notes. However, although the documentation was visibly improved, staff at 5 treatment practices noted that physicians spent more time documenting notes than with paper, either during the patient visit (which took time away from face-to-face interactions with patients) or at the end of the day. In addition, a physician at one treatment practice questioned the volume of documentation, stating that if, for example, he is screening a patient for diabetes during an office visit, he should not have to review some of the general health maintenance items, as they are not all relevant to the visit.

More efficient practice due to elimination of paper charts. Several interviewed staff reported that there was a noticeable improvement in efficiency at the practice. Specifically, one treatment practice noted that the administrative burden was dramatically reduced now that there

was no need to pull paper charts and print results to put into the charts. In addition, two treatment practices reported that patients received answers to their questions more promptly due to the ability of administrative staff to (1) look up information in the electronic system (without pulling a paper chart) and (2) contact the physician via electronic message. An office manager at a solo treatment practice noted that the physician now has about 10 additional minutes during each visit to spend with the patient (from 20 minutes to 30) because he can enter all his notes in the EHR during instead of after the visit. This is remarkable, but atypical of impacts of the EHR implementation reported by other practices—it reflects the physician's relatively inefficient style of documentation before the shift, and a good fit of the system to his typing ability.

Integrating EHR into established systems. One treatment practice associated with a large medical group is benefiting from support of the medical group's IT department in the ongoing implementation of its EHR system. The IT department is supplementing the medical group's home-grown system (which contains an e-prescribing system, a clinical data port, a patient portal, and a link to hospital medical records and tests) with the EHR in such a way that its electronic capabilities (for care management, for example) will be seen as an extension to those already in existence. The EHR is being customized so it can be used at all of the medical group's locations.

Change in number of staff. During the initial implementation phase of its EHR, a large treatment practice augmented its staff (now at 53 employees) with several temporary employees charged with scanning and entering data from the paper charts into the electronic system. Two of these temporary staff were later hired as MAs and enter patient data. Another treatment practice (with 3 physicians) was hoping to decrease the number of staff once operations become more efficient.

2. Changes Among Control Practices

Similar to the treatment practices, the control practices with EHRs reported an improvement in documentation due to the EHR templates, and administrative burden had decreased. As with 4 of the treatment practices, MAs at one control practice have more responsibility for documentation of patient vital and test results in the EHR. None of the control practices had experienced or expected any staff increases or reductions as a result of the electronic systems.

C. Practices' Experience with EHR Features

Interviewed staff members at treatment and control practices with EHRs were generally interested in using their EHRs to improve patient care and make the practice more efficient. However, they also expressed some level of dissatisfaction with the EHR features.

1. Treatment Practices

a. Features that Support Clinical Care

Treatment practice staff reported that multiple EHR features were helping improve the care offered, including electronic patient visit notes, electronic viewing of test results, e-prescribing, alerts and reminders, electronically downloadable educational materials, and clinical messaging (Table III.3). One treatment practice reported that the ability to electronically order laboratory tests and view results had enabled MAs at the practice to be actively involved in care: for the

past three years, they have reviewed test results and followed up with patients with outstanding test results (for mammograms, for example). At this practice, MAs can also print out educational materials (for example, about how to follow a low cholesterol diet) and review them with patients at the time of a visit. Seven of the visited treatment practices noted that, due to the ability to electronically enter and view patient visit notes, as well as problem and medication lists, more complete and useful information was available to practice staff at the time of patient visits. Several physicians at 2 separate treatment practices noted it was much easier to access and track patient information (such as medication use and abuse or test results), thereby ensuring faster followup with patients if there is an alert for a specific problem or test result.

Table III.3. Selected EHR Features Cited as Supporting Clinical Care

Feature	Number of Treatment Practices
Electronic patient visit notes (including accompanying templates, problem and medication lists)	7
Online results viewing for laboratory tests and imaging (including ability to produce a graph of test results over time)	5
E-prescribing (including referencing drug formularies at time of prescription, screening for drug interactions, online prescription transmission to pharmacy)	5
Automated patient-specific alerts and reminders	3
Patient-specific educational materials	1
Clinical messaging with other physicians and practice staff	1

Source: Mathematica interviews with practice physicians and administrative staff at 12 treatment practices using EHRs, spring/summer 2010.

b. Problematic EHR Features

Staff at the visited treatment practices expressed frustration with many of the same EHR features they believed have had a positive impact on clinical care, including templates to organize entry of electronic patient visit notes, alerts and reminders, electronic viewing and ordering of laboratory tests, educational materials, and e-prescribing (Table III.4). These features were viewed as problematic due to (1) their bulk, including the number of templates and copious information contained within each template; and (2) the time they add to patient visits, including time spent entering data, which reportedly resulted in a less efficient workflow.

Too much data entry. Although interviewed staff said that the practices benefited from the improved documentation available through the EHR, staff at 6 treatment practices also emphasized that EHRs contained too many templates, with voluminous information displayed in a manner that is not user-friendly. Physicians at 4 treatment practices also reported that the EHRs had impacted their ability to maintain visual contact with patients during the visit; they were too busy flipping between the templates and entering relevant data. Physicians at one treatment practice chose to ignore the templates altogether and dictated their notes into the EHR. Only one practice reported an attempt at a solution: an office manager at a large treatment practice said that to deal with the "overwhelming" nature of the EHRs and improve the ability of physicians to use the EHR system effectively, the practice now requires physicians to complete eight hours of continuing education on using the EHR.

Table III.4. Problematic EHR Features

Feature	Reason Feature Is Problematic	Number of Treatment Practices
Electronic patient visit notes (including accompanying templates)	Templates not physician-friendly; too many templates	6
Automated patient-specific alerts (for drug interactions) and reminders (for preventive care)	Too many alerts/reminders; not all preventive tests are warranted	6
Online ordering and results viewing for laboratory tests and imaging	Lack of interoperability with laboratory or imaging facilities; too expensive to connect to vendors; results are not complete; physicians do not know how to order tests; too time-consuming to use online ordering	3
Patient-specific educational materials	Not specific to geriatric population	1
E-prescribing	Lack of interoperability with local pharmacies	1

Source: Mathematica interviews with practice physicians and administrative staff at 12 treatment practices using EHRs, spring/summer 2010.

Too many alerts and reminders. While interviewed practice staff were appreciative of the EHR system's alerts (for allergies and drug interactions) and reminders (for preventive services), they were dissatisfied with the sheer volume and inability to customize them. The office manager at a large treatment practice reported that the practice's IT department was able to adjust the number of alerts and reminders; however, practice staff still found alerts for drug interactions were too frequent and were often not helpful to the physicians. A physician at one treatment practice reported he was not heeding the clinical reminders for preventive services because of debate in the literature about when to stop performing such tests as mammograms, colonoscopies, and prostate exams.

Issues with interoperability. Interviewed staff members were interested in achieving better interoperability with hospitals and laboratory and imaging vendors so they could order tests, view results, and seamlessly exchange information as patients moved to and from the hospital. However, 2 treatment practices reported they were impeded by the costs of the interfaces with other health care organizations. One treatment practice reported it cost approximately $1,300 to connect with each organization; only one associated organization, a large laboratory, was covering these costs. Two treatment practices found online ordering of laboratory tests too time-consuming and difficult to use, although, at the time of the site visits, it was not clear whether ordering was taking place through an internet or EHR interface with the laboratory vendor.

2. Control Practices

When talking about the impact of the EHR on quality of care, the five visited control practices using an EHR remarked on many of the same EHR features as their treatment counterparts. The features improved the ability to have complete information in hand at the start of a patient visit, and included: (1) electronic patient visit notes (4 practices), (2) online diagnostic test viewing (2 practices), (3) alerts and reminders (2 practices), and (4) e-prescribing (1 practice). Of these, several functions were also seen as problematic. As was reported by treatment practices, control practices found there to be too many templates (3 practices), and

alerts and reminders (1 practice), and experienced issues with interoperability with vendors (1 practice).

D. Barriers to Adoption and Use of EHRs

Interviewed staff at treatment and control practices commented on several barriers to adoption and use of EHRs. While those at practices with EHRs were committed to using their EHRs, they noted several hurdles to effective use, including the time and labor necessary to implement EHRs, the complexity of the electronic systems, lack of interoperability with other systems, and insufficient technical support. Those without EHRs were hindered by the anticipated high labor and monetary costs of adoption.

1. Treatment Practices

a. Treatment Practices with EHRs

Time and labor cost of implementation and transition. Interviewed staff reported that it took more time than expected to fully implement an EHR system and to learn how to use it efficiently. For example, an administrator at a solo treatment practice reported that during the first two years of EHR adoption about 50 percent of her time at the office was devoted to learning how to use the EHR, and she still spends about one-quarter of her time dealing with system malfunctions and calling the vendor for technical support.

In addition to the time devoted to implementation, interviewed staff at 3 treatment practices found that it was a burden on staff labor to transition from paper to electronic charts. The office manager at a large treatment practice said the paper charts were incomplete, illegible, or contained inaccurate data, and was forced to train additional staff to gather, scan, and enter relevant data into the EHR system. Another treatment practice reported that its larger medical group had developed a program to load patient charts into the system for newer practices so the transition was not as "painful" as in the past.

Complexity of templates. After implementation, physicians at several of the visited practices were discouraged by the unwieldy nature of the EHR templates, as described above. It is possible that this, along with (1) a culture in which physicians act separately from others in the practice when documenting patient visits, and (2) lack of training (in terms of entering patient histories, notes, test results, and medications), contributed to a lack of consistent documentation across staff, which was alluded to by 3 treatment practices. In an attempt to improve use of the EHR across practice staff, some of the larger treatment practices with dedicated IT staff (5 practices) reported they were customizing the templates.

Lack of interoperability. As mentioned above, two treatment practices were hindered in their attempts to interface with laboratory and imaging facilities due to the high cost of interfacing the EHR with other systems. A third treatment practice was constrained by the inability to communicate electronically with other provider systems to improve care coordination.

Problematic vendor support. One treatment practice reported inadequate vendor support for its EHR system. Although this practice had been satisfied with the reporting capabilities of its prior system, it recently switched to a new system because of dissatisfaction with the support

provided by that first vendor. The first vendor returned calls within a two-week window; the current vendor provides technical support within one day.

b. Treatment Practices Without EHRs

Treatment practices without EHRs cited high costs of adoption and implementation as the barrier, in terms of the initial and continuing maintenance cost of the systems (1 practice) and the time and manpower it would take to implement the system (1 practice). A solo practitioner at a treatment practice felt it would not be worth investing in a system at this point because there was a chance, given the volume of EHRs on the market, any system chosen might not be in existence in a few years. Another treatment practice believed it had inadequate staff to scan and transfer paper charts into an electronic system.

2. Control Practices

a. Control Practices with EHRs

As with the treatment practices we visited, the five control practices with EHRs reported several barriers to effective adoption and use of EHRs, including the labor burden of transitioning from paper to electronic charts, and the complexity of the templates. One control practice was frustrated by the inability to get vendor response to problems occurring after normal business hours, as there had been several instances when the EHR system's database was inaccessible (including during the site visit), and the problem was not fixed until the next business day.

b. Control Practices Without EHRs

The three control practices without EHRs were hindered in their adoption by the same issues as the treatment practices without EHRs, including the labor and monetary cost of implementing and sustaining the system. In addition, two control practices expressed concern about the potential decreases in physician productivity, anticipating that entering data during patient visits would decrease the number of patients who could be seen every day.

IV. CARE MANAGEMENT AND QUALITY MEASUREMENT

Care management and quality measurement are intended to be hand-in-hand activities: knowledge about quality performance as a result of quality measurement guides a practice toward care-management activities, which, in turn, boosts performance. However, care management is also intended to be patient-centric and comprehensive, and may extend well beyond the quality measures being used at any given point in time. This chapter provides a baseline snapshot of the treatment and control group practices' activities in care management and quality measurement which will be updated in several years when we re-examine them to learn what has changed and in what ways changes may be related to the demonstration.

A. Care Management

All but two of the 16 visited treatment group practices articulated one or more care-management activities—defined as routines designed to improve patient care. The two that said they did no care management were the only solo practitioners we visited. Practices that described some care-management activities included those with and without EHRs. However, all saw clear potential for an EHR to facilitate much better care management. For example, one respondent commented, "Our chief medical officer is huge into quality. But we couldn't do any of it without the EHR…you could maybe track one thing, but not all of it…for example, we couldn't keep track of bleeding time on Coumadin patients without EHRs, you'd have to wade through too many charts."

While most practices were engaged in some care management at the time of a visit—and were hoping to do more in the future—the specific activities and combinations of activities were diverse. Below we provide a window into the types of care-management activities underway in these practices. The list may appear impressive, but, in fact, to achieve the advanced medical home ideals beginning to be embodied in the EHR Incentive Program "meaningful use" criteria and the medical home joint principles, endorsed by major physician organizations. Even the two practices that were much farther along than others (Table IV.1) had considerable room for advancement, for example, their EHR systems lacked interoperability with other providers to allow comprehensive and timely information about their patients' whole care.

1. Care Management at the Time of a Visit (or Other Patient-Initiated Contact)

Use of front-desk and MA staff. Six practices stressed the importance of the MAs and staff at the front desk to care management. Important activities performed by them included accessing health maintenance records when patients check in to let them know what tests or screenings are due (and flagging this for the doctor); implementing standing orders such as automatic referral for an annual eye exam for diabetic patients; and printing out a medications list and asking patients to update it while waiting to see the physician.

Flags, alerts, and reminders at time of the visit. Five practices discussed using flags, alerts, and reminders at the time of patient visits, including some still using paper charts rather than EHRs. In a paper-charts environment, one practice routinely flags the chart with the fact that a patient has diabetes, and a nurse checks for any needed guideline-appropriate services, noting them for the provider. Another uses a form with preventive services on a piece of paper in the chart to flag needed services that have not been done. Other practices use templates or

flowsheets for diabetes, and/or have reminders built into their EHRs for preventive services and alerts for medication interactions.

Table IV.1. Care Management in Two Relatively More Advanced Practices

More Advanced Care Management Practice 1
Staffing: 5 MDs, 2 RNs, 6 MAs, and 3.5 front-desk staff
EHR: Yes, and separate registries
Affiliation: Yes, is owned by a large health system
Using EHR to identify for followup orders that are outstanding (tests not taken or results not reported back) or results that are abnormal
With roughly 20 "standing orders" in place, front-desk staff and MAs have joint responsibility with the physicians for patient care; among other benefits this frees the doctor to do "things that you need a doctor for."
Prints written educational materials from the EHR (such as how to follow a low-salt or low-cholesterol diet)
Outreaches to patients on a monthly basis after seeing the "dashboard reports" on quality indicators produced by the system's central staff and receiving lists of individuals missing needed services (alternates focus from month to month because of staff and time limitations)
"Return-to-office" order given to every patient before he or she leaves so each knows when to return
Condition-specific decision support is used within the EHR based on disease-specific templates; however, the templates are being refined for patients with multiple chronic conditions to improve physicians' use because of the limited time of a routine visit
Letters are sent out from system's central office to remind patients about needed preventive care
More Advanced Care Management Practice 2
Staffing: 6 MDs, 3 NPs, 2 part-time front-desk staff, 7 MAs, 3 mental health providers, 1 podiatrist, 1 radiology tech, and an office manager
EHR: Yes
Affiliation: Yes, is owned by a large health system that among other attributes has its own Medicare Advantage plan
Patient portal provides a list of suggestions to the patient, medications, lab results, and medical history. Family members of elderly patients reportedly often use this to keep abreast of a loved one's status and the doctor's recommendations. Patients can use it to request appointments
Reminders for preventive services are embedded in the EHR templates that are used
Reaches out to patients quarterly with letters and phone calls after "dashboard report" is run from the EHR and finds individuals overdue for services
Every patient gets a printed list of medications and of next steps as he or she leaves

Patient education and guidance. Three practices are routinely giving patients individualized guidance: at one practice, patients leave with a printed list of medications and next steps; in another, every patient gets a "return to office order" that clearly specifies a return date; the third is using a recent EHR upgrade to begin goal-setting with patients. Two practices mentioned that some of the physicians print out patient education materials regularly for their patients, though that was specific to particular physicians.

Other care management. The following were also mentioned (one practice each):

- One practice has 20 standing orders, that is, care that can be given or referred without the physician initiating the order, including pneumococcal vaccine for patients over 65, mammograms if the patient has visited at least once in the past year, and annual eye exam for patients with diabetes.
- In one practice, when patients ask for prescription refills, at least one nurse checks to see whether any blood tests are overdue and schedules those that are needed.
- One physician reported routinely using tools in the EHR to assist with diagnosis and severity assessment (Activities of Daily Living (ADL), Independent Activities of Daily Living (IADL), and depression scales.
- One practice asks its patients to bring their medicines to every visit for review.

2. Care Management Beyond the Visit

Calls and/or letters to patients overdue for services. Seven practices were calling or sending letters to at least some patients identified as needing a service. One uses a paper tickler file to remind staff whom to call (although it recently adopted an EHR, it is focusing on using the basic functions first). Another practice with no EHR uses a service called MDdatacor, which queries text in transcription notes to identify patients who are missing needed services. Others use reports run from their EHR to identify the individuals for reminders.

Obtaining information from a patient's other providers. Three practices have a process in place to obtain information from a patient's other providers: one tracks orders for tests through its EHR and daily "runs down" any outstanding results, one set up a process with local optometric providers to obtain eye exam results from its diabetic patients, and one that works primarily with the elderly now requires its affiliated home health agency to email patient reports—formerly it was difficult to read the reports it would get.

Two other care-management approaches were described:

- One practice has a case manager, made available by the local hospital, who "coordinates communication between all the doctors" for patients discharged from the hospital. She also calls the practice's discharged patients "two days earlier than we were able to" in the past to make sure they are doing what they need to do.
- As previously mentioned, one practice has about one-tenth of its patients (250) using a patient portal that it says helps family members of its very elderly patients know when a prescription has changed or when patients with memory loss issues forget what transpired at the visit.

B. Practice Experience with Quality Measurement

Some practices in the demonstration have already been engaged in other quality measurement activities that overlap with demonstration measures, and so may find it easier to respond to demonstration incentives. Conversely, it is possible that practices without previous engagement in quality measurement will gain the most from the demonstration when it enters the quality reporting phase, as they discover their standing in relation to other practices. Either way, an initial snapshot of the status of visited practices' experience with quality measurement appears useful as it can be compared with updated information later in the demonstration.

Eleven practices were engaged to some degree with quality measurement outside the demonstration, while a handful (5 practices, including at least one in each site) reported not having seen any quality measures calculated for their practice. Four practices periodically see payer-specific data from insurers with whom they contract—such as an annual HEDIS report, or quality measures computed from claims or enhanced claims (for example, claims plus laboratory) data—but that is the extent of their involvement in quality measurement. In contrast, five practices are seeing quality measures data that is generated for the whole of their practice (some of them also receive quality reports from payers). These efforts include:

- Two practices' larger owner organizations run "dashboard reports" monthly or quarterly from their EHR system for all the practices in the organization (including those we visited) with measures that overlap the demonstration measures.
- One practice's owner organization uses a contractor to collect data from paper charts for diabetes measures for all the owned practices (this system does not have an EHR).
- One practice participates in Minnesota Community Measurement, a public reporting initiative.
- In one practice, the physician we met with reports running graphs and analyzing data "every couple of weeks" as a hobby

Another practice participates with its Medicare Quality Improvement Organization (QIO) in its "core prevention" initiative, an effort under the QIO program's 9th Scope of Work, and so sees flu and pneumonia vaccination rates for its Medicare population. And one practice said it tracks patient health indicators for diabetes as well as seeing reports from local payers, but more information was not available.

C. Care Management and Quality Measurement in the Control Group

1. Care Management

Like the treatment group, most visited control group practices articulated at least one care-management activity (6 of the 8 practices). One that did not was an independent three-physician practice not using an EHR, indicating lack of care management is not strictly limited to solo practitioners (though the other that did no care management was, in fact, a solo practice).

Similar to the treatment group practices, the control group practices were engaged in a range of activities at the point of care (such as use of flowsheets for diabetes or preventive care, and reminders in the EHR), and between visits (such as calling patients needing services, either from payer lists or their own EHR- or registry-generated lists). Unique activities we saw in the control group were (one practice each):

- A practice where staff "to-do" lists are generated automatically from the EHR, listing who they need to send reminders to; MAs use these daily, we were told.
- One practice orders patients with chronic illness to come in every six months—one of these visits each year is for an overall annual physical, and the other is for chronic disease monitoring to make sure all guideline-appropriate services are up-to-date.

Also of note, two practices were not advanced in care management yet, but the system that owns one of them was testing all the MAs for competency on a set of responsibilities they will take on in the future, and educating those who fell below the expected level. Another had a trained health coach, but due to financing uncertainties had not yet been using this individual to meet with patients as they hope to in the near future.

2. Quality Measurement

The only notable difference between the visited control group practices' experience with quality measurement compared to the treatment group was that proportionately fewer of the visited control group practices were engaged in quality measurement (4 of 8 control practices, versus 11 of 16 treatment practices). As with the treatment group, several control group practices reported receiving quality measure reports from payers on those specific populations, while several others were seeing quality reports generated for their whole practice by larger organizations that owned them or through their EHR.

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V. KEY FINDINGS AND CONSIDERATIONS

This analysis of implementation at such an early stage in the demonstration (year 1 of 5) has two main contributions: (1) to provide a baseline descriptive picture of demonstration practices to contrast to a similar snapshot which will be taken much later, and (2) to identify emerging issues where followup by CMS or others could improve demonstration results. The descriptive picture was provided in earlier chapters. Here we identify key findings and emerging issues and suggest possible implications for CMS policy and/or action moving forward.

1. **The environment—with several relevant programs operating alongside the demonstration—is increasingly complex.**

   State and private-sector efforts as well as new federal initiatives are poised to add complexity to the decision making that demonstration participants must engage in. Many of the relevant efforts were just getting underway at the time of our visits, but the clear potential exists for either a positive or negative effect on demonstration outcomes from these emerging developments—positive if it is clear to practices where other efforts fit in and that they are complementary to the demonstration, and negative if they compete with scarce practice resources to meet different requirements.

   Consideration: CMS may want to consider informing or assisting the community partners in informing practices on where or how the demonstration fits with other relevant initiatives. This would have to be done site by site and be coordinated with those major efforts to ensure clear and accurate messaging.

2. **Visited practices were not very engaged in the demonstration in year 1.**

   Most practices had only a vague awareness of the demonstration at the time of our visit near the end of demonstration year 1, including most of the practices that were using their EHRs in relatively advanced ways. Our observation from another demonstration with similarities to this one (MCMP) is that practices become more engaged in a demonstration when they are required to do something and then see the feedback from it, which was not provided for in the EHRD's first year.[26] Because the year 1 incentive rewards the adoption of certified EHRs and the level of use of EHR functions, it will be the practices that were already more advanced in using an EHR that receive most of the year 1 demonstration dollars. The few practices that were influenced in some way by the demonstration in year 1 were those who had yet to acquire an EHR or (in one case) were using it only for basic functions.

   Consideration: This finding is a function of demonstration design, because required activities in year 1 were minimal and minimum EHR use requirements do not apply until the end of year 2. As CMS moves forward with other incentive-based programs, a similar situation may occur where most of the dollars could be paid to practices that

[26] For example, practices participating in the MCMP demonstration were paid for reporting baseline quality measures in the first year.

have done nothing to improve their EHR use or quality. CMS may want to consider if this is an acceptable, inherent feature of any program that realigns incentives toward quality, or whether incentive design in future programs should be targeted toward rewarding new health IT adoption or improvements in use (or improvements in quality).

Note that this assessment applies only to the first year of the demonstration. It is very possible that practices will become more engaged in future years and will produce the more favorable situation where a large majority of practices respond to the demonstration incentive and program incentive dollars are thus spread mostly among practices that are improving EHR use and patient care.

3. **The largest opportunities for improved EHR use among current users are in (1) increasing patient engagement and adherence, (2) improving clinical decision support, and (3) communicating about care that takes place outside the primary care practice.**

Electronically interfacing with other providers—the main requirement to score very well on the domain having to do with communicating about care outside the practice—incurs costs beyond acquiring an EHR system, and practices have no control over whether the providers they would like to interface with will incur their own costs to set up the interface. Therefore, advancing on this dimension during the demonstration timeframe may depend as much on the success of state and national-level initiatives toward HIE as it does on practices' interest in responding to the demonstration.

Our site visits lead us to believe that use of clinical decision support functions is being undermined by technical issues with the over-sensitivity of alerts built into many of the EHR products. The low levels of practices generating lists of patients who need services—another component of the clinical decision support domain—seems to be in part a system issue (the system is not capable or the practice does not know how to fully use the system), but also a matter of practices finding the time to consistently follow up on such lists, indicated by the 25 to 42 percent of practices (Appendix A, Section 3) that have run such lists at least once but do not do it regularly.

Based on some physicians' comments, the fact that practices are not now using their systems well to increase patient engagement or adherence seems in part related to the FFS payment system that does not pay physicians for exchanging emails with patients and which does not encourage practices to take the time to provide, review, and monitor a customized self-management plan for patients with chronic conditions, nor to proactively follow up if chronically ill patients do not present for routine monitoring. The demonstration's pay-for-performance incentives are intended to shift this; whether they will be strong enough remains to be seen.

Consideration: CMS may want to communicate to both treatment and control practices (since this is a randomized demonstration) the potential for improvement in these areas, and with the help of the community partners point them to specific technical assistance resources that they could use to improve. To the treatment

practices only, CMS could highlight the financial reward (systems payment) that would go along with higher scores in these domains.

4. **Some care management is common in the demonstration practices, but was quite limited in scope and scale.**

   The site visits validated the sense from the OSS survey results that while some care management was occurring, its overall scope and scale was quite limited. While not all care management was taking place using the EHR as a tool, the potential for EHRs to advance care-management capabilities was widely recognized. Taken as a group, the practices had implemented an interesting array of care-management activities that varied in their approach but tended to emphasize teamwork beyond the physician. The primary importance of this finding is to support the demonstration's embedded concept that there are many actions practices could take, if the demonstration incentives and/or other factors motivate them, to improve patient care.

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PART II:

SITE-SPECIFIC REPORTS

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During May-June 2010, the evaluation team visited four treatment group and two control group practices in each of the four EHR demonstration sites. Part II of the report presents the results of each of these site visits. These visits occurred in the 12th and 13th month after the demonstration's start on June 1, 2009.

The practices were selected to provide a mix in terms of urban/rural location, use of health IT, number of physicians, number of FFS Medicare beneficiaries, affiliation, and number of beneficiaries with each chronic condition. We also considered location—while we avoided tight clustering, we generally selected practices that were within a couple of hours' drive from a major city. (More detail about the selection process is provided in Part I, Chapter I.)

Discussions were usually held with at least two people per practice—a physician and an administrative staff member knowledgeable about the demonstration. When possible, we also spoke with nurses and medical assistants, as well as with the medical director and such administrative personnel as the chief information officer and chief financial officer, if applicable. The discussions lasted one to two hours per practice.

Each site visit report in this section follows a common outline, reflecting the major topics that were discussed with each practice:

- The community partner and the local environment
- Treatment group practices
  - Visited practices' structure and staffing
  - Perspectives on the demonstration and early response
  - Health it use and plans
  - Current and planned care-management strategies
  - Quality measurement
- Control group practice

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I. LOUISIANA

The treatment practices visited in Louisiana are in the early stages of using EHRs and developing care-management processes. Of the four visited practices, three were using EHR systems (the other planned to implement one within a year) and each reported having at least one care-management activity in place Although the demonstration is not yet having substantial impacts in the four visited practices on health IT use or prompting more advanced care-management activities or quality measurement, it is serving as a reminder of the value of systematically tracking clinical data to more effectively manage patient care, especially in practices where a physician or staff member is advocating for health IT or actively involved in care-management activities.

A. The Community Partner and the Local Environment

Role of community partner. The Louisiana Health Care Quality Forum (LHCQF), composed of such organizations as the Louisiana State Medical Society, the Louisiana Academy of Family Physicians, and Blue Cross Blue Shield of Louisiana, is the community partner in Louisiana and is also the state Regional Extension Center (REC). The LHCQF was responsible for assisting CMS in recruiting practices into the demonstration, and has conducted a provider assessment survey to understand the progress practices are making in acquiring and implementing EHRs. (LHCQF will use the survey results to help practices implement EHR systems.) To recruit practices, LHCQF leveraged the positions of its committee members, who were able to reach a wide range of the physician audience; distributed mass emails; made periodic announcements at physician events and conferences; and called physician offices. The LHCQF was successful in recruiting 204 practices to apply to the demonstration, 104 of which were then randomized to the treatment group, and 100 to the control group.

Local environment. Treatment practices reported no participation in private pay-for-performance programs, though one interviewee said at least one private payer had sent letters mentioning the possibility of implementing some type of pay-for-performance program. Given interviewee responses, it was difficult to gauge the presence of private sector pay-for-performance programs; however, we visited a geographically diverse group of practices and if such programs were becoming prominent (versus FFS), it is likely we would have heard more about them. A New Orleans area physician mentioned limited claims auditing performed by some local insurers, but did not say the audits affected reimbursement (and no interviewees reported participating in initiatives putting providers at financial risk for performance on quality measures).

With respect to public sector programs, two practices reported participation in Medicare's e-prescribing program. Interviewees at two other practices reported being aware of the PQRS program but did not participate: a physician at one practice was concerned about delayed reimbursements and an office manager at another noted a burdensome amount of paperwork.

Meaningful use, state REC, and HIE. Some interviewees reported being aware of meaningful use incentives and HIE planning, but they conveyed no concrete plans to become involved. Of the three practices that were aware of the meaningful use incentives, only one appeared to have begun to examine the programs and how they might affect her practice (for example, she knew her practice would not qualify for Medicaid incentives but was planning to

take advantage of the Medicare incentives). This interviewee, the office manager of an internal medicine practice in New Orleans, also said she had "signed up for the REC," but she did not think that would offer much assistance as her practice has been using an EHR system for more than one year. No other interviewee mentioned the state REC.

Two practices were aware of a planning process for implementation of statewide HIE infrastructure, having heard some mention of it at conferences, but neither knew many details. There is, in fact, an HIE initiative underway in the New Orleans area as part of a Beacon grant. The Louisiana Public Health Institute and local stakeholders received $13 million to reduce health disparities, improve diabetes care and outcomes, and enable health IT and HIE capabilities among safety net providers and "isolated" providers. It was unclear if the interviewees were speaking of that initiative, but one physician expressed interest in the concept and wondered "how much it would cost" for him to participate in the exchange.

B. Treatment Group Practices

1. Visited Practices' Structure and Staffing

The four treatment practices we visited in Louisiana greatly varied in size, location, and affiliations:

- **Solo urban practice.** This independent, single-physician practice in New Orleans serves only a small Medicare FFS population but more than 60 percent of office visits are made by Medicare Advantage beneficiaries. The staff consists of two medical assistants, an office manager, a receptionist, and a part-time billing clerk.
- **Mid-size independent internal medicine practice.** This physician-owned group in New Orleans includes 14 internists, including specialists in nephrology, endocrinology, infectious disease, and pulmonary medicine. The practice employs 53 people, including nurse practitioners, medical assistants, and front-office and billing staff. The practice sees a large proportion of Medicare patients, as Medicare FFS patients and Medicare Advantage patients each represent 30 percent of its patient panel.
- **Independent three-physician practice.** About half of the patients of this independent family practice, located in a town of about 23,000 in the southwestern part of the state, are Medicare FFS patients, and very few are Medicare Advantage beneficiaries. Other staff members include three nurse's aides, a licensed practical nurse, a medical assistant, and approximately five fulltime front-desk staff and office clerks.
- **Affiliated practice.** This practice is located in a parish between New Orleans and Baton Rouge that has seen dramatic population growth since Hurricane Katrina. It is part of a multi-specialty group that is a wholly owned subsidiary of a local hospital that is part of a Baton Rouge-based health system. The group consists of 10 practice sites and four primary care practices participating in the demonstration. The practice we visited has one participating physician. Medical group management oversees the practices, conducting periodic quality assessments and providing technical support.

2. Perspectives on the Demonstration and Early Response

Awareness of and decision to participate in the demonstration. At each treatment practice at least one employee was aware of most aspects of the demonstration, though awareness among physicians was low at two of the four treatment group practices. The director of ancillary services (the physician we interviewed) and the office manager of the mid-size practice in New Orleans, and the lead physician at the practice in southwest Louisiana were each familiar with the payment mechanisms and related quality measures of the demonstration. The medical group management of the affiliated practice made the decision to participate in the demonstration, and the physician we interviewed attended a conference on the demonstration. The office manager at the solo practice in New Orleans was responsible for the practice's participation, but her awareness of the demonstration's payment mechanisms and associated quality measures was very low.

Perspectives on the demonstration and pay-for-performance. At the time of our site visits, most interviewees were in the early stages of familiarizing themselves with the demonstration and they were, for the most part, neutral toward the demonstration and hopeful the incentive payments might offset health IT costs. Two interviewees made specific comments with respect to the demonstration: an office manager at the mid-size practice in New Orleans said she appreciates that the demonstration is phased in over time, and the solo practitioner in New Orleans felt incentives should be available for care provided to Medicare Advantage patients.

Most interviewees agreed in principle with the concept of pay-for-performance or felt that the industry was moving toward methods of payment used in pay-for-performance programs. A physician at one practice expressed concerns that pay-for-performance programs might penalize providers who take care of noncompliant patients and said there should be some type of exclusion in pay-for-performance payment mechanisms for noncompliant patients.

Impact of the demonstration. Where the demonstration has had an effect, it has served to reinforce practices' ongoing activities related to EHR use and, to a lesser extent, care-management activities. For instance, one office manager said the demonstration has reinforced the practice's efforts to document provision of preventive services. At the practice planning to implement an EHR system in a year, the demonstration was influencing its EHR search, as the practice hoped to adopt one that would allow tracking of clinical data associated with demonstration performance measures. At a practice that recently started using a new EHR system, the lead physician sought assurance from the community partner that the new system would support reporting functions pertinent to the demonstration. In addition to these specific examples, the demonstration has begun to raise awareness among at least some staff members regarding the need for standardized documentation and EHR use.

3. Health IT Use and Plans

Current EHR use. There are a range of functions in use across the three treatment practices using EHRs, and EHR use is not yet standardized across staff members within each practice (that is, data are not consistently entered in the same way and use of core functions varies across staff). It is worth noting that the practices have had varying durations to grow accustomed to their systems. One practice has used EHRs since 2004-2005 (though it switched to a new system in October 2009); the solo practice in New Orleans began using its system in

2007; and the mid-size New Orleans practice began using the clinical side of its EHR system in April 2009.

While practices vary in their use of EHR functions, each continues to use paper in some way: one has not yet scanned in patient data from more than two years ago; another does not electronically receive patient data from labs or other providers; and one physician continues to use paper charts for most patients. Nevertheless, each reported using EHRs to enter clinical notes, and each practice reported the availability of at least one type of reminder, such as alerting providers when a diabetic patient needs an A1C test. Also of note: each practice uses (though unevenly across staff members) condition-specific templates or "health maintenance" templates containing lists and historical information regarding provision of certain preventive or condition-specific services. E-prescribing functions are also available within each practice's system. Two practices reported they were able to use the EHR to generate educational material for patients. Finally, two of three practices reported being able to electronically view lab and/or radiology results, but only one can electronically order lab work.

Use of additional health IT. Other than EHR use, the most significant other use of health IT was occurring at a treatment practice that had established a patient web portal accessible on the practice's website. The portal is made available by the practice's EHR vendor and allows patients to not only request appointments and medication refills but also to submit short questions for a nurse and questions about insurance coverage.

Facilitators to implementing and using EHRs. Treatment practices with EHRs reported several common activities regarding facilitation of EHR acquisition: Two practices received some type of financial support to acquire their systems: EHR software and hardware were donated to one; another partnered with a hospital-based physician group to purchase that system. At the other two practices physicians were so committed to adopting EHRs they required no "outside help" in acquiring their systems (though one is still in the final stages of acquisition).

Implementing EHR systems necessitated certain actions to ensure physicians and staff members could actually use them. Each hired individuals (administrative employees) after EHR acquisition; two said they hired people specifically to transfer patient data from paper charts to EHRs. Immediately after implementation, one practice reduced patient visits to allow staff members to more easily adapt to using the EHR, and another received on-site vendor support during the week after implementation. Allocating additional resources (in the form of new hires and more hours worked by existing employees) after EHR implementation was common at each practice attempting to transition from paper charts to EHRs.

Vendor support and having a physician or staff member who takes a leadership role in advancing health IT also appears to have improved EHR use. Two practices regularly rely on vendor support to facilitate EHR use. One switched to a new EHR system due to poor support provided by the first vendor (the current vendor reportedly provides good support); an office manager at another practice helped form and now leads an "EHR committee" responsible for identifying problems and establishing goals for future EHR use within the practice.

Following EHR implementation, treatment practices using EHRs reported time and experience improved EHR use. For example, a nurse at one practice said staff frequently share "short cuts" they learn about using the EHR system with other staff members.

Barriers to implementing and using EHRs. With the exception of the practice that received EHR software and hardware as a donation, treatment practices did not mention any barriers to EHR acquisition, but they spoke of several barriers to smooth EHR implementation. One office manager reported having to replace a staff member who could not adjust to using the EHR system; she said she knows of this occurring at other practices where employees don't have much experience using computer software. An office manager at another practice told us her practice should have decreased post-implementation patient appointments by half for several days and also should have assessed how EHR use would affect workflow. Because the practice maintained a full schedule and physicians did not take time to learn the system, several physicians there have been unable to effectively utilize it.

Each practice mentioned several barriers to improved EHR use. Interviewees at each practice reported uneven use of EHRs by physicians or staff members. For instance, a solo practitioner with an EHR system in place continues to write clinical notes by hand and a physician at another practice uses paper charts for most patients. Another example of "uneven" EHR use was the ad hoc use of condition- or patient-specific system reminders for certain services (such as provision of lipid profiles for patients with coronary artery disease). Staff members at each practice are aware of reminder capabilities of their systems, but they are not used (or "activated") consistently by all of them.

Interviewees also noted software and infrastructure barriers to improved EHR use. Cost and technical issues are often intertwined, as small practices often must hire IT consultants to address certain issues. For instance, an office manager at one practice said the EHR system often "stops communicating" with the server, and each time this happens, she must pay an IT consultant to remedy the situation. Physicians at two practices said their systems present information that is not necessarily pertinent to a specific patient visit. One characterized this as a dilemma of "noise versus good information," noting that finding relevant information is sometimes difficult; another said he ignores alerts for certain drug interactions.

Problems associated with entering patient data in EHRs were also reported. An office manager said some templates (general health maintenance templates or templates specific to certain groups of patients, such as diabetics) require "too many mouse clicks" to arrive at appropriate data fields. While this practice is able to electronically place lab orders, the office manager said it can be time-consuming for physicians, as the user must match the order to diagnosis codes, and physicians often place orders based on a physical finding or test associated with a particular patient. Similarly, since this is an internal medicine practice where each physician has a particular clinical focus (for example, nephrology or infectious disease), it is burdensome to set up multiple charge and order lists. The office manager at this practice also reported that when patients come in for a specialty visit, the EHR provides no easy way to view the history of preventive services.

With respect to health IT infrastructure, two practices reported barriers to electronic exchange of patient data. The solo practitioner in New Orleans said he would have to pay for interfaces to be established to electronically receive results of lab tests or X-rays conducted by external providers. At another practice, the physician said the capability exists in their EHR system to electronically order and view X-rays, but the cost of establishing an interface prohibits that.

Plans for future use of EHRs and Health IT. Only one of the three visited treatment practices using an EHR system reported specific future plans; the others expressed aspirations but no concrete plans. The mid-size internal medicine practice in New Orleans has several initiatives underway, most of which are being led by the office manager, including working to establish an electronic interface with a local hospital to facilitate exchange of patient data. As previously mentioned, this practice formed an EHR committee, which is moving forward to set and track goals for EHR use. Related to this effort is a physician survey which the office manager will review to understand what keeps physicians from more effectively using the system. The office manager will also be conducting one-on-one training sessions to improve physicians' use of the system. Finally, the office manager said she plans to set up charge and order lists relevant to each physician's clinical focus to ensure physicians can easily order and charge for services within the EHR.

The treatment practice without an EHR system will implement one within one year. This practice is part of a multi-specialty group owned by a hospital that is part of a local health system that, with medical group management, formed a committee to seek an EHR system that is clinically relevant and compatible with the group's practice management system. Information system employees of the health system are meeting with vendors and will provide support to practices upon implementation.

Of the two treatment practices using EHRs that wish for improved EHR use but have no firm plans, one practice would like increased connectivity to be able to electronically place orders, but the physician we interviewed said it would be too expensive to enable this;[27] the other would like to use reporting capabilities of the EHR system, but this appears to require reaching out for additional vendor support, and it was unclear whether the practice planned to do that.

4. Current and Planned Care-Management Strategies

Current activities in care management. Care-management activities are carried out by treatment practices on a mostly ad hoc basis and are largely driven by specific physicians or staff members. Relatively routine activities in place include the following:

- Physicians and staff at one practice routinely use the EHR system to track provision of preventive services and services for diabetic patients. The physician reported using a "health maintenance" template in the EHR that has helped manage patient care.
- One practice is now regularly receiving electronic patient reports from home health agencies by email, which has been helpful in coordinating patient care because the written reports were reportedly difficult to read.
- Physicians and staff members at another practice are increasingly utilizing preventive service reminders within their EHR system. The office manager reported that the

[27] The physician indicated there were costs associated with gaining access to networks/databases of one or more lab companies in the area. The precise cost was unclear.

demonstration is reinforcing documentation efforts which support effective use of these EHR reminders.

Practices reported that other care-management activities are carried out on ad hoc basis, usually because of the actions of certain individuals at each practice. Such activities include:

- Patient outreach, including following up with patients in need of certain services based on lists received from private payers, and phoning patients who miss an appointment.
- Use of condition-specific EHR and paper templates to ensure important patient data is captured.
- Generation of patient education materials via an EHR system or the Internet.

Plans to implement additional activities. Practices reported both aspirations and concrete plans with respect to additional care-management activities. Three treatment practices reported having plans in place to implement additional care-management activities (though in one case the activities are rather general and contingent upon effective EHR use):

- At a practice where a physician is holding group visits for diabetic patients, the lead physician plans to examine indicators pertinent to co-morbidities to address other areas of care deserving attention (for example, blood pressure and lipid control).
- One practice plans to use EHR reporting functions to create lists of patients needing additional care and better manage care for patients with chronic conditions.
- At a practice that will implement an EHR system, a physician has general plans to use it to better manage care of patients with chronic conditions.

Interviewees at each practice also expressed aspirations to implement additional care-management activities. One practice wants to use its EHR to create lists of patients needing services (but the office manager said they do not have the resources to hire another employee for this purpose). A physician at another practice wants to enhance care management by communicating with patients via email (for example, sending charts and medication lists). The physician holding group visits for diabetic patients is considering arranging similar group sessions for hypertension patients (pending results of the group with diabetes). Finally, this physician also said he would like to be able to easily search patient education materials via the practice's EHR system.

5. Quality Measurement

Visited treatment practices reported limited experience with viewing performance on quality measures. Interviewees at each practice reported receiving from private payers lists of patients needing certain services (for example, mammograms). Two practices reported receiving provider-level reports of performance on quality measures. A physician and office manager at one practice reported being responsible for generating ad hoc reports of provider performance on certain measures (such as rates of provision of bone density scans). Physicians at this practice are informally made aware of benchmarks at occasional meetings to discuss performance (without naming names). An employee of the medical group management team associated with

the affiliated practice periodically performs chart reviews on certain preventive measures and shares the results with physicians and other clinical staff.

C. Control Group Practices

We visited two control practices during our trip to Louisiana on June 14 and June 16, 2010. One in the New Orleans area recently joined a hospital-owned multi-specialty group consisting of 34 physicians. The physician we interviewed is medical director of the group; he is an internist and his practice consists of one other primary care physician and employs three MAs and one receptionist. At least 30 percent of the practice's patient population are Medicare FFS patients and about 15 percent are Medicare Advantage beneficiaries. The practice reported using an EHR system for about three years, but will be switching to a new one because it was acquired by the hospital.

The other control practice we visited, in a small town in the southwestern part of the state, is an independent family practice with three family practitioners, two office managers, and one insurance clerk. About 25 percent of the practice's patients are Medicare FFS beneficiaries; very few are Medicare Advantage patients. This practice was not using an EHR system.

With respect to health IT use and care management, the two control practices were quite different from the treatment practices. Compared to the treatment practices, the hospital-owned practice was fairly advanced in EHR use and care-management activities. The current EHR system has capabilities similar to the systems in use by the treatment practices, but the physician and staff we interviewed appear to utilize certain functions to a greater extent. For example, an office manager and MA both mentioned the utility of viewing lab results in the EHR, as that permits easy viewing of trends. Further, an MA (who is the practice's EHR "champion") reported regular use of system prompts for services due (for example, colonoscopies). Because of strong leadership from the physician, the practice offers enhanced care management to its patients. For example, the physician schedules patients with chronic conditions at least twice a year: one appointment is an annual physical; another is a checkup. The physician makes it clear to patients that they must do certain things (such as come in twice a year), and if they don't they must find another doctor. The physician reported that patients respond well to his directness, recalling that only one patient in six months left the practice.

The other control practice, as previously mentioned, was not using an EHR, and had no plans to acquire one due to a skeptical physician leader in the latter portion of his career. The practice used a hand-held e-prescribing device for about one year but stopped because physicians were writing scripts by hand prior to entering them into the device, creating a time-consuming redundancy. Care-management activities were virtually non-existent due to the lead physician's view that consistent provision of preventive care has not been shown to save money.

In the area of quality measurement, the two control practices were similar to the treatment practices in that they had limited experience with it. Neither practice reported participation in any pay-for-performance programs, though the physician at the hospital-owned practice had participated in PQRS. This physician also said that as part of an effort by the medical group and hospital management to establish "clinical integration" between inpatient and outpatient settings, physicians will receive reports on their performance on quality measures (which he said are essentially PQRS measures) that he helped establish.

II. MARYLAND AND DISTRICT OF COLUMBIA

In the Maryland and D.C. region, there are significant differences in the use of health IT and knowledge of the demonstration between very small, unaffiliated practices composed of one or two physicians, and medium-size practices of five to six physicians affiliated with larger multi-practice organizations. In both the treatment and control groups, the unaffiliated one- and two-physician practices are less advanced in their use of EHRs, are not producing or receiving quality measures, and have implemented fewer systematic care management processes. These practices did not report participating in other pay-for-performance or other incentive programs from private payers or CMS, have little or no awareness of the outreach activities by the state Health Information Exchange (HIE) and Regional Extension Center (REC), and had more questions and misunderstandings about the EHR demonstration rules and criteria for payment. Despite this, two of the three small practices are using an EHR system and are very satisfied with its effect on their practices, and the remaining practice plans to acquire an EHR within a year—although staff report struggling to find help to evaluate and select an EHR system that will meet the needs of their practice. In contrast, the three medium-size practices affiliated with large multi-practice organizations rely on a dedicated IT staff from the corporate office to acquire or maintain an EHR system. Two of the three have had an EHR in place for years, and those practices are using it to produce quality measures and to support care management. All three of the medium-size practices are participating in other private and public payer quality incentive programs, and all are taking steps to improve quality.

A. The Community Partner and the Local Environment

In the Maryland and D.C. area, the Maryland Medical Society (MedChi), D.C. Medical Society, and Maryland Health Care Commission (MHCC) collaborated as the community partner to recruit practices to participate in the demonstration. While the number of practices that applied for the demonstration exceeded the goal of the community partner,[28] recruitment was more difficult than anticipated. Fewer small practices than expected were interested in or prepared to acquire an EHR; many of the practices that applied for the demonstration already had an EHR or were on the verge of purchasing one. Additionally, many practices that had participated in PQRS were reluctant to apply, because the payments for that program had been much smaller than anticipated.

Other pay-for-performance programs are operating in the region, although the small practices visited were unaware of them. In Maryland, the MHCC is in the early stages of launching a patient-centered medical home initiative that will provide incentive payments to participating practices. The two medium-size treatment practices expressed interest in participating in the state's medical home program as well as in a forthcoming Medicare medical home demonstration.[29] Both practices are also participating in PQRS. Additionally, two of the

[28] 255 practices applied to the demonstration and were randomized: 127 into the treatment group and 128 into the control group.

[29] These practices may not have realized that they are only permitted to participate in one CMS payment demonstration at a time.

medium-size practices are participating in the "Bridges to Excellence" program, in which practices that are certified by NCQA are eligible to receive additional payments from commercial payers.

Chesapeake Regional Information System for our Patients (CRISP) is the state HIE and REC. The two medium-size treatment practices were aware of CRISP's HIE work and plan to participate in the exchange once it is operational. None of the visited practices reported receiving assistance yet from CRISP in its role as the REC.

B. Treatment Group Practices

1. Visited Practices' Structure and Staffing

Four participating practices and two control practices were visited in the Maryland and D.C. area; five are located in the suburbs of Baltimore and Washington; one is within the District of Columbia. Three are unaffiliated solo or two-physician practices and three are owned by larger organizations—two by larger hospital systems; one by a continuing-care retirement community.

Among the visited practices, two are small (one to two physicians) practices that serve between 1,000 and 1,500 Medicare patients representing 40 and 70 percent of all patients respectively. One of these practices implemented an EHR in the past year; the other has not yet acquired an EHR. The other two are medium-sized practices (five to six physicians and three nurses--nurse practitioners at one practice and a mix of RN and LPNs at the other), and both are part of larger organizations that own more than a dozen practices in the Maryland and D.C. area. One practice serves primarily a younger, commercially insured population—its 200 Medicare patients comprise about 5 percent of all patients. The other practice serves older patients exclusively—around 98 percent of the patient population is enrolled in FFS Medicare or a Medicare Advantage plan. Both practices owned by larger organizations have EHRs that pre-date the demonstration.

2. Perspectives on the Demonstration and Early Response

Reasons for participating in the demonstration varied among the practices visited. In the two medium-size practices, corporate staff became aware of the demonstration and encouraged their practices to apply. Multiple practices at each organization elected to apply, and the applications for the demonstration were coordinated through the corporate headquarters of the parent organization. The corporate staff at these organizations experienced little cost in participating in the demonstration because EHRs had been acquired and installed years before and because the burden of applying and reporting was significantly less when handled centrally for several practices. The clinical staff at both practices indicated they made the decision to participate to show that they are already providing high-quality care. In contrast, both small practices decided to participate to help offset the cost of acquiring a new EHR.

Views on the demonstration. None of the practices could provide a specific dollar amount they expect to receive from the demonstration, although all but one knows the maximum amount they are eligible for based on the number of physicians participating. The office staff and clinician at the two-physician practice expressed considerable uncertainty about how the incentive payments for the demonstration were structured or calculated, and had expected an upfront payment of $1,500. The physician in the solo practice is more informed about the

incentive payments, although he too was unaware that the ultimate size of the payment would depend upon the score the practice received on the OSS. The physician was hoping to receive the maximum payment possible, but said he would be satisfied with an amount that would cover the upfront investment for the EHR software and three computers at the practice (about $5,000). In contrast, in both of the medium-size practices corporate-level administrative staff are knowledgeable about the criteria on which the incentive payments will be based. Neither of the two practices has included the expected payment in its budget for the upcoming years, as neither was certain of receiving the full incentive payment. One medium-size practice expressed frustration that the relationship between the payment amount and the specific functionalities of the EHR is not clearer. That practice had several new functionalities on its "wish list," including some listed on the OSS, and the medical director is unable to determine whether investing money to acquire those new functionalities would be recouped through the demonstration.

Three of the practices did not express any concerns about the demonstration. One medium-size practice had no concerns at the time of the application, but since then has grown worried about the process for reporting the quality measures in the second year: if they must abstract data and manually fill out information on each of the participating clinicians rather than submitting data electronically, the cost of reporting may exceed the incentive payments.

Views on pay-for-performance. All of the practices are supportive of the concept of pay for performance; many express the view that they are already providing high-quality care and it is appropriate for them to receive higher payments for doing so. The medium-size practices currently tie around 2.5 to 4 percent of their physicians' salaries to quality measures.

The two medium-size practices are participating in PQRS and are actively pursuing participation in the upcoming CMS and Maryland medical homes demonstrations. Both expressed a desire for CMS to be more responsive to the needs of practices that participate in multiple demonstrations or initiatives that have similar or overlapping reporting requirements. Individuals in the corporate office of both practices reported having created their own spreadsheets to track how the measures for each program are calculated and where they overlap so they can keep track of how potential changes to the EHR system may affect the reporting across all the programs they participate in.

Influences on practice functions. All four practices reported that the demonstration has had no direct impact on the functioning of the practice. The solo practice that decided to participate to help offset the cost of acquiring an EHR expressed a belief that participating in the demonstration led the practice to implement an EHR sooner than it would have otherwise, but believed that the purchase would have occurred even in the absence of the demonstration.

3. Health IT Use and Plans

Three of the four practices participating in the demonstration have an EHR system in place, including both medium-size practices and the solo practice. The two-physician practice does not have an EHR, although it hopes to acquire one by the end of the second year of the demonstration.

Current health IT use. The two organizations owning the medium-size practices implemented EHR systems across all of their practices in 2003 and 2007, respectively. Both practices are completely paperless, and are using their EHRs to record visit and procedure notes,

remind physicians about preventive services and overdue tests, order and receive laboratory tests from at least one major provider, and prescribe medications. While the EHR at each practice has been in place for years prior to the demonstration, both practices reported making continuous "tweaks" to optimize functionality for the patient population they serve. Both reported that the pre-loaded templates and forms were not ideal for physicians serving a geriatric population, and that physician workflow was initially hampered by the need to fill out several separate templates when dealing with patients with several conditions. The changes that each practice has made to its EHR includes streamlining templates for patients with multiple conditions and configuring reminders to prompt physicians to check on issues specifically related to the geriatric population, such as risk of falling or overdue pneumococcal vaccination. One practice also reported a need to alter the reminders for preventive services because the recommendations for such services as prostate cancer screening, frequently change, particularly for the elderly population. One RN remarked that the effect of these "tweaks" to the EHR means the practice is now using the system as a clinical tool rather than merely for information storage and retrieval.

The solo practice implemented an EHR system in 2009, and was still learning the functionalities of the system at the time of the visit. The EHR is being used primarily to record visit and procedure notes and as a messaging system for staff to communicate with the physician about specific patients. The EHR had recently been updated to include reminders about preventive care and overdue tests, but the physician was not yet using this functionality; the office is still using a combination of paper and electronic records, and as a result the reminders will not be accurate until all previous tests are scanned into the system. The practice is using a stand-alone e-prescribing system, but plans to begin using the electronic prescribing function in the EHR. As in the medium-size practices, the physician reported that the pre-loaded templates and forms in the EHR are not always applicable to the geriatric population, particularly because few of those patients have only a single complaint during a visit—which requires using several separate templates or manually typing in the visit notes, both of which are more time-consuming than the physician had expected.

The two-physician practice is using a stand-alone e-prescribing system for most of its Medicare patients, but has not yet acquired an EHR. The practice has not made much progress in finding an EHR, and expressed frustration with locating information to guide the practice toward selecting an affordable system appropriate for a small practice. The physician interviewed at the practice is interested in an affordable system that will be easy to use, but does not have any other criteria or expectations for the functionality of the system. Both staff and clinicians at the practice are looking forward to using an EHR, as they expect the system to make the practice run more efficiently, but the practice manager expressed reservations about the ability of the practice to maintain the software and hardware without an IT person on staff.

Changes to the practice due to health IT. The process of implementing the EHR system caused the physician in the solo practice to lose productivity for six to eight weeks, during which time he scheduled fewer patients per day and opened the practice for an additional day each week to make up for the lower volume. There were virtually no changes to staff responsibilities that have resulted from the new EHR; the medical assistant and office manager reported using the messaging system rather than sticky notes to communicate with the physician, but otherwise their roles are unchanged. The physician reported having more time to spend with patients during each 30-minute appointment, since the five minutes of charting he usually handled after the appointment could be taken care of during the visit.

The two medium-size practices reported that there are members of the staff at the corporate headquarters that work fulltime on health IT, but little or no staff time at the practice level is currently spent with continuing upgrades. However, both practices reported that staffing had changed as a result of implementing EHRs. A vice president of one organization reported that across all of their practices, those with mature EHRs had seen a reduction in one fulltime staff member due to lower administrative burden. The other practice reported that the number of staff has not changed, but responsibilities have; whereas front-desk staff at the practice once dealt with medical record requests, the central administrative office now handles those requests. The president of the organization reported a plan has been developed to re-allocate those resources into clinical positions, such as physician assistants, in the future. One medium-size practice also reported that the EHR has allowed medical assistants and front-desk staff to take on greater responsibility for patient care, including entering basic information about patients into charts, checking on and delivering overdue vaccinations, or scheduling needed tests for patients with chronic conditions.

Future plans for health IT. The three practices that are using EHRs reported plans to expand the capabilities of their systems to send and receive data from other providers. Both of the medium-size practices are exploring options for creating an interface with the hospital or hospitals that serve most of their patients. One of the medium-size practices reported an effort on the corporate level to make it easier and faster for physicians to enter data, which they said goes hand in hand with increased quality reporting.

The two-physician practice with no EHR plans to select and acquire one by the deadline to remain in the demonstration.

4. Current and Planned Care-Management Strategies

The amount and type of care management varied across practices. The solo practice is not yet engaged in any systematic care management; the physician said he uses his memory to keep track of the care needed by his patients. The physician did feel that the implementation of a new EHR has resulted in a better system for tracking abnormal or overdue test results, which are now more visible in the EHR system compared to a piece of paper that might be lost in a paper chart. The practice plans to begin using some of the functionalities of the new EHR to facilitate care management, including reminders about preventive care and overdue tests for patients with chronic illness, as soon as all records are scanned into the system.

The two-physician practice uses its appointment and billing system to send reminders to its patients about needed tests. After an appointment, one of the physicians asks the medical assistant to use the recall system in the software to schedule the patient's needed tests over the year, such as mammograms or colonoscopies. The physician also uses a sheet of paper on each patient's chart to keep track of tests and other needed care for patients with chronic illness. The practice also reported occasionally receiving reminders from patients' insurance companies about overdue care, which the physician found helpful.

The two medium-size practices with mature EHRs have some systematic care management processes in place. Both are using the EHRs to track abnormal or missing test results; printing a summary of "next steps," including when the next appointment should be scheduled, for patients at the end of each visit; and doing outreach to patients who are missing certain recommended care based on any quality measures on which the practice scored poorly. One of the practices

has also instituted "standing orders," which allow medical assistants and front-desk staff to provide routine care—including giving vaccinations, ordering tests, or writing referrals—for any patient who meets the clinical criteria and has visited the practice within the past year. For example, the practice has a standing order for eye exams for diabetic patients, which means front-desk staff can check the EHR for a patient's history and make a referral—rather than requiring an office visit or speaking with the physician—when a diabetic patient calls.

None of the practices reported that the demonstration had an effect on the care management processes in place, and none had implemented new care management or changed major aspects of their existing care management in the past year.

5. Quality Measurement

Neither of the small practices is producing or receiving any quality measures, but the organizations owning the two medium-size practices are creating physician- and practice-specific quality measures for all of their practices, on a monthly or quarterly basis. For both practices, these reports consist of both process and outcome measures, and a mix of preventive care measures related to geriatrics and measures specifically related to conditions such as diabetes or heart failure. The medical directors can request a list of patients who had not received the recommended care, and in both practices procedures are in place to follow up with patients on measures where a physician or the entire practice has scored poorly.

The organizations owning the two medium-size practices also provide the medical director at each site with quality measures that are being reported to outside entities: in one case, Healthcare Effectiveness Data and Information Set (HEDIS) measures that are being reported to insurance companies, and in the other, PQRS measures that are being reported to CMS. Staff at the corporate offices reported that in addition to providing data to these external organizations, they also calculate practice performance and share the measures internally with the medical directors because the time lag between the measurement period and release of the final quality reports by the outside entities is too long to allow physicians to correct any deficiencies that may be occurring. Additionally, selected HEDIS and PQRS measures are included in the monthly or quarterly quality reports that are routinely created for the medical directors.

C. Control Group Practices

Two control practices were visited: a medium-size practice owned by a larger organization that owns multiple primary care practices, and a solo practice.

As was the case with all of the medium-size practices we visited, the larger organization that owns the practice had helped many of their practices apply to participate in the demonstration, and some were selected into the treatment group, while others (including the visited control practice) were not. Unlike the two medium-size treatment practices that were visited for the study, however, this control practice does not yet have an EHR in place. The corporate staff of the parent organization is in the process of selecting, acquiring, and implementing an EHR, and anticipates rolling out the EHR system across its practices between the spring and fall of 2011. Since some of the practices owned by the parent organization are participating in the demonstration, the timeline for implementation as well as features desired in an EHR system were in part determined by the requirements of the demonstration. The treatment practices owned by the parent organization (not visited for this study) will implement the EHR system

earlier in 2011, in order to maintain eligibility for participating in the demonstration, while the visited control practice anticipates implementing its EHR later in the year.

The solo practice had acquired an EHR in 2003, and that was a major factor in the decision to apply to participate in the demonstration, because the physician expected to incur very few new costs in order to be eligible for the incentive payments.

As with the treatment practices, the use of care management processes and responsibilities of the non-physician staff varies with the size of the practice. In the solo practice, the physician is solely responsible for care management, and there were no systematic care management processes in place. The physician was aware of functionalities in his EHR that would assist with care management, like reminders for overdue tests, and hoped to begin using them soon. In the medium-size practice, systematic care management is not yet in place, but the corporate office is in the process of undertaking a readiness assessment that involves creating systems to track tests and other pieces of patient information in a systematic way.

Neither of the control practices is producing or receiving quality measures.

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III. SOUTHWEST PENNSYLVANIA

Overall, the treatment and control practices visited in the Pittsburgh region in southwest Pennsylvania reported similar experiences with health IT implementation, care management strategies, and quality measurement. All but one of the visited practices had implemented or was in the process of implementing an EHR and had some basic care management strategies in place, such as patient reminders. Formal quality improvement initiatives were less common with only a couple of practices actively monitoring quality or pursuing specific quality improvement programs. Most of the practices visited had plans to improve their health IT and to better integrate care management and quality measurement with their EHRs. As of the end of the first year, the EHR demonstration did not seem to have impacted the types of health IT implemented or the care processes pursued by the practices. This report provides an overview of the local Pittsburgh environment then synthesizes the treatment practices' responses to the demonstration and experiences with health IT, care management strategies, and quality measurement and concludes with a comparison to the control group practices.

A. The Community Partner and the Local Environment

Community partner role. The Pittsburgh Regional Health Initiative (PRHI), an independent organization implementing initiatives to improve health care safety and quality, is the community partner for the Pittsburgh demonstration site. After experiencing difficulties recruiting practices through emails and letters to providers, PRHI partnered with six local hospitals to recruit practices to the demonstration; these hospitals had existing relationships with local providers and encouraged them to attend informational meetings held by the community partner and CMS. This strategy was critical to PHRI's successful recruitment of 279 practices to the demonstration, of which 138 were randomized to the treatment group and 141 to the control group.

Local initiatives. All of the visited practices, both treatment and control, participate, with varying degrees of success, in pay-for-performance programs offered by the two major insurance carriers in the Pittsburgh area, Highmark Blue Cross Blue Shield (Highmark) and the University of Pittsburgh Medical Center Health Plan. In addition to evaluating providers on a range of quality metrics, Highmark assesses practices on EHR functionality. Both programs provide three levels of additional reimbursement, depending on the quality score the practices receive.

In addition to participating in its pay-for-performance program, two of the visited practices, one treatment and one control, received funding through Highmark's health IT grant program that pays up to 75 percent of the cost of an e-prescribing system or EHR up to $7,000 per physician. Eight treatment and 11 control practices are also participating in the Pennsylvania Governor's Chronic Care Initiative, which promotes implementing disease registries and disease management strategies for diabetes in the Pittsburgh region.

B. Treatment Group Practices

1. Visited Practices' Structure and Staffing

The four visited treatment practices represent a range of practice structures, sizes, and locations, ranging from a solo, unaffiliated practice in a small city south of Pittsburgh to a medium-sized affiliated practice in a Pittsburgh suburb. Each practice is described below:

- **Solo, unaffiliated practice.** In addition to the physician, this practice has a full-time registered nurse, LPN, and medical assistant as well as a part-time billing clerk. The office is located in a small, depressed city with a declining population. Medicare fee-for-service (FFS) beneficiaries and Medicare Advantage comprise approximately 10 percent and 70 percent of the practice's patient base, respectively.
- **Unaffiliated practice.** This unaffiliated practice, located in a small outlying Pittsburgh suburb, has three physicians and six secretarial staff members. Medicare FFS beneficiaries and Medicare Advantage make up approximately 60 percent and 15 percent of their patients, respectively.
- **Affiliated practice.** This practice is located in a small, outlying Pittsburgh suburb, and has three physicians, one office manager, five full-time medical assistants, two part- time medical records staff, two receptionists, and one billing clerk. The practice is affiliated with a large medical group composed of 25 practices and more than 100 physicians. All of the medical group's primary care practices signed up to participate in the demonstration. Approximately 6 percent of the practice's patients are Medicare FFS beneficiaries and 13 percent are enrolled in Medicare Advantage.
- **Partially owned practice.** This practice has two locations, one of which is owned by a local hospital. The practice has three physicians, a nurse practitioner, and a physician's assistant, all of whom are participating in the demonstration. One practice manager, two medical secretaries, six medical assistants, and two licensed practice nurses also work at the practice. Approximately 52 percent of the practice's patients are Medicare beneficiaries.

To help both control and treatment practices implement their EHRs, PRHI received funding from Highmark and the Jewish Healthcare Foundation, PRHI's parent organization. With these funds, PRHI created a series of training models, is holding workshops on different implementation topics, and is providing free technical assistance for both treatment and control practices. The interviewed PRHI staff indicated that there has been less demand for technical assistance than expected from smaller unaffiliated practices, but that they are seeing increased interest as practices are starting to feel pressured to implement an EHR before the end of the second demonstration year.

PRHI is also a subcontractor to the Regional Extension Center (REC) in Western Pennsylvania. The interviewed staff indicated that, while the REC and the EHR demonstration have similar goals, PRHI plays slightly different roles on each project. For example, PHRI staff can identify and negotiate with EHR vendors in its role as a REC subcontractor, whereas they must remain vendor neutral when assisting practices enrolled in the EHR demonstration. The staff indicated that explaining their different roles to the practices is difficult and some practices feel that the meaningful use incentives and the demonstration are competing initiatives. PRHI

staff indicated that, in the wake of the Health Information Technology for Economic and Clinical Health (HITECH) act, they see the need for increased integration across the two initiatives.

"Meaningful use" incentives. The community partner indicated that the combination of EHR demonstration incentives and "meaningful use" incentives available through the HITECH Medicare and Medicaid incentive programs are encouraging some treatment practices to move forward with implementation of an EHR system, but that other practices have indicated they are willing to be penalized for non-adoption of an EHR because they believe that, for them, it is less expensive to be penalized than to implement. The visited practices had a range of views on the "meaningful use" incentives. One of the interviewed treatment practices indicated that it will change or add to its current EHR functionality in order to qualify to receive the incentives. Another practice indicated that the incentives will not impact its timeline for implementation; for this practice, implementing a quality product, with all of the technical issues resolved, is more important than gaining potential incentives.

2. Perspectives on the Demonstration and Early Response

Perspectives on pay-for-performance. All four of the visited treatment group practices expressed concern about pay-for-performance programs. Three practices indicated that it is taxing to invest the necessary time and resources to respond to all of the different programs; the solo practitioner indicated he lacked the resources to complete documentation for any of the pay-for-performance programs and, as a result, does not receive rewards from the programs.

In addition, two practices had reservations about the methods used by the programs to generate payments; specifically, that the claims data, which they must submit to be eligible for one of the local pay-for-performance programs, does not always reflect diabetic eye exams that take place at other locations or prescriptions that are either provided through free samples or filled at a generic prescription program at a pharmacy. One practice was particularly concerned that in the pay-for-performance programs, they are compared to practices with healthier patients and speculated that physicians at other practices might "dump" patients with multiple chronic conditions with the hope that they would then receive higher payments. Due partially to their frustrations with pay-for-performance programs, two of the treatment practices indicated that they will not adjust their practice's behaviors to receive incentives; they believe that they already provide high quality care and do not want to alter the types of patients they see.

Decision to participate in the demonstration. According to PRHI staff, practices that are owned or associated with a large medical group were more interested than smaller practices in participating in the demonstration, perhaps due to the medical group's connection to the six hospitals that helped PRHI provide outreach for the demonstration. PRHI also noted that most of the small, unaffiliated practices participating in the demonstration either had purchased an EHR or were considering implementation prior to their involvement in the demonstration. Practices located in rural settings and physicians nearing retirement were less interested in participating in the demonstration.

Among the visited treatment practices, the decision to participate in the demonstration was made by either the lead physicians (two practices) or senior administration at the larger organization to which the practice belongs (two practices), and was largely influenced by the availability of financial incentives. According to the community partner, practices who applied to be in the demonstration were most concerned about several critical issues: (1) the chance of

being assigned to the control group (and therefore not receiving the incentive); (2) not receiving upfront money for implementation of the EHR; and (3) those practices that had not previously participated in a demonstration or an incentive program were concerned with the ability to meet the reporting requirements.

Impact of the demonstration. The community partner expressed concerns about the ability of practices to succeed under the demonstration. PHRI staff said it is difficult for practices, especially those with one or two physicians, to find the financial resources and time to implement and optimize their EHR. These difficulties are compounded by the recession; some of the treatment practices have told the community partner that they will be unable to implement an EHR system by the end of the second year of the demonstration. According to PHRI staff, practices are concerned about the ability to succeed because some aspects of the demonstration remain unclear to them, including whether they have been assigned to the treatment or control group and whether PRHI can influence their assignment status. PRHI staff noted that this confusion can make it difficult for them to work effectively with control group practices. For treatment group practices' successful involvement in the demonstration, the community partner stated that the reporting requirements should be clarified. One interviewed physician reported that he continues to have a difficult time gathering specific information on CMS requirements.

Overall, the visited practices feel the demonstration incentives will have a limited impact on their activities. The staff at three of the visited practices, all of which have or will soon have EHRs, stated that the incentives had no influence on the extent or pace of EHR implementation; one practice that is constructing a comprehensive EHR system felt that speeding up its adoption process would leave the practice at risk of poorer quality of care. Another practice, however, indicated it would add additional functions, if necessary, to gain more incentives. At the other end of the adoption spectrum, the one visited physician at a practice not currently moving forward with implementation indicated that the incentives are not large enough to keep him from dropping out of the demonstration.

Beyond the financial benefit from the incentives, practices found involvement in the demonstration to be beneficial in two ways. One practice found the workshops held by the community partner informative, in that they provided guidelines for implementation and a forum for practice staff to share stories about EHR implementation. Another practice expected that the benchmarking data on the submitted quality measures would be useful for its quality improvement initiatives.

3. Health IT Use and Plans

Use of EHRs. Based on surveys completed at community partner hosted events and data provided by Highmark, who reimburses providers based on EHR functionality, the community partner estimates the percentage of treatment practices using an EHR with basic functionality has increased from approximately 40 percent at the start of the demonstration to approximately 60 percent at the end of the first year. While they reported that they expect more practices to implement EHRs during the second year of the demonstration, PRHI staff found that some practices do not plan to move forward because they do not expect the demonstration incentives and "meaningful use" incentives to cover enough of the costs associated with EHR adoption.

The visited treatment practices reflect the range of EHR implementation reported by the community partner. Two of the practices currently use EHRs; one has used its system for almost

two years and reported using most of the functions,[30] and the other implemented its system less than a year ago and still relies partially on paper charts. One practice indicated they would implement an EHR system in August 2010, with the help of the larger medical group's IT department, and will serve as a "test" practice for the medical group. The EHR system will combine a stand-alone e-prescribing system and an electronic medical record, as well as some other home-grown components. One practice does not have an EHR due to its cost, and does not expect to implement an EHR in the future.

Both of the practices that have implemented EHRs have made adjustments to their systems, such as customizing templates or implementing an electronic dictation system to better fit the offices' workflow. However, the practices remain concerned that their systems produce too many imprecise alerts, the language in their systems is too stiff, and the systems are not well integrated with referring providers. Still, while both practices feel their systems can be improved, each is happy with its decision to implement an EHR. The practices reported that they now see benefits from using EHRs, including an increase in efficiency (for example, improved ability to prescribe medication due to e-prescribing), and patient safety (due to use of the allergy and medication lists on the EHR). Moreover, one practice reported that the billing features in the system have improved the quality of their claims and increased revenue by at least 10 percent.

Use of other health IT. Three of the practices visited had stand-alone e-prescribing systems, including the practice without an EHR, the practice implementing an EHR, and the practice that has had an EHR for less than a year. The latter two practices plan to integrate the e-prescribing functions into their EHR systems in the near future. The practice that is implementing a comprehensive, home-grown EHR system also uses a clinical access portal, through which physicians can access 3 years of patient data on mobile devices and 15 years of data on computers, including laboratory and imaging results and medication lists.

Facilitators to implementation. The visited practices indicated that assistance with purchasing and implementing EHRs was important. One practice reported that it sought and received $7,000 per physician, a total of $21,000 for the practice, from Highmark to implement its EHR system, and relied on vendors and consultants to help implement the product. Two practices received or will receive funding, training, and technical support for implementation from the organizations with which they were affiliated (a large medical group and a hospital). In addition to financial and technical assistance, all of the visited practices currently using or implementing EHRs stated that it is crucial to review multiple systems before selecting a product and, once the system is selected, to add more functional capabilities to the EHR as the practice staff becomes more comfortable with the system. Throughout the selection and adoption period, two of the practices agreed that health IT steering committees composed of physicians and office managers from different associated practices were important for both (1) gaining provider input while selecting a system and (2) addressing problems that arose during implementation.

[30] The practice reported recording procedure notes, using clinical alerts and reminders, reviewing laboratory and radiology results, generating lists of patients requiring intervention and educational materials for patients, screening prescriptions against allergies and for drug-drug and drug-disease interactions, identifying generic equivalents, as well as referencing the drug formulary, evidence-based guidelines for prescriptions, and the patient's medication list.

Barriers to implementation. All four of the visited treatment group practices indicated that the cost of an EHR was a major barrier to implementation. As mentioned above, those practices that have implemented a system or plan to implement a system required external funding. The physician at the solo practice cited the cost of purchasing and maintaining an EHR system as an insurmountable barrier, especially given the recession and reductions in Medicare payments. Other barriers included entering patient data into the system, which proved to be the most onerous part of implementation for the two practices with EHRs, and the interruptions in and adjustments to workflow brought about by system updates, which can be frustrating to practice staff.

Plans for the future. Among the visited practices, two have specific plans for improving their health IT in the future. One of these practices, as mentioned above, planned to implement its EHR in August 2010. The second practice with specific plans for improving their health IT plans to change its e-prescribing vendor and integrate the e-prescribing system into their EHR. Within the next eight months, the practice also plans to implement order entry for laboratory tests and imaging, although the practice manager said that the extent of these changes and other smaller adjustments to the system, such as customizing text in patient reminders, depends partially on available resources. Of the remaining two practices without specific plans for improving their health IT, the practice without an EHR had no plans to implement an EHR, and the other practice, which has an EHR, may make changes to its adoption and use of additional functions, if necessary, to receive financial incentives from pay-for-performance programs.

4. Current and Planned Care Management Strategies

Types of care management. The community partner surmised that incentives for the demonstration and "meaningful use" were impacting the way in which enrolled practices thought about care management. At the same time, interviewed PRHI staff suspected that the EHRs used by some of the practices may not support the care management activities that practices want to implement. For example, the community partner reported that some practices are running stand-alone registries outside of their EHRs because the EHR registry functions are not user-friendly and the EHR does not interface well with the registries.

In contrast to the community partner, the treatment practices visited did not indicate that incentives were impacting their care management activities. With the exception of the solo practice, all practices visited reported some level of care management, such as providing patients with educational materials and sending patient reminders to complete necessary tests and schedule follow-up appointments. In addition to these basic activities, one practice now has a case manager (assigned to the practice by the hospital that partially owns the practice), who helps patients in the practice transition to and from hospital care by coordinating with their physicians and calling or visiting the patients to follow up on their care.

Two of the visited practices reported that they are using health IT to improve care management. One practice tracks patient indicators in the EHR, uses templates for certain categories of patients, and established alerts for patients needing services. The limitations to these tools included stilted language in the templates and the inability to target alerts to a specific subset of patients; it was unclear at the time of the visit whether changes would be made to the EHR to address these issues. In the second practice, physicians receive electronic alerts when patients are admitted to the hospital or a nursing home, track patient outcomes in a clinical

access portal, and use the portal to more quickly reconcile medications upon patient discharge from the hospital.

Plans for the future. The three practices currently using or implementing an EHR plan to improve care management and better integrate their care management strategies with their EHRs. One practice plans to move its patient reminder system and patient educational materials into the EHR system and begin using the EHR's disease registry functions. Another practice plans to design and integrate disease management functionalities into their EHR such as templates to collect information during visits with patients who have multiple chronic conditions.

5. Quality Measurement

As a whole, the treatment practices visited in the Pittsburgh area are doing little analysis of quality measures and are not pursuing formal quality improvement activities. Three of the four practices reported reviewing quality reports received from insurers and indicated they will review data received from the demonstration. One practice also reported reviewing practice-level trends generated by the EHR every few weeks, although the interviewed physician indicated that, while the produced reports provide interesting statistics, they have not impacted physician behavior. Two other visited practices expressed interest in using their EHRs to produce quality reports in the future. Only one practice, with the solo physician, reported a lack of resources to collect and evaluate data; the physician stated that his inability to work with quality data limits the rewards (financial and otherwise) the practice gains from pay-for-performance programs.

While there was not much overall quality improvement activity at any of the practices at the time of the site visit, the medical group that oversees one of the visited practices seemed to be thinking about future quality improvement activities for all of the affiliated practices, and has a quality committee focused on linking quality improvement to the EHR. Future plans include implementing a clinical quality system within the next year that will score patients based on their level of disease management, producing disease-specific quality reports for providers, and allowing providers to review quality metrics within the system.

C. Control Group Practices

In addition to the treatment practices visited, we also visited two control practices, both located in Pittsburgh. One practice had one physician, one office manager and three medical assistants, and had about 11 percent Medicare FFS and 11 percent Medicare Advantage patients. The second practice had four physicians, medical assistants, billers, and front desk staff. The practice is affiliated with a larger medical group and has approximately 40 percent Medicare FFS and 15 percent Medicare Advantage patients. Both practices reported that they participate in local pay-for-performance initiatives.

For the most part, the control practices reported experiences with health IT similar to those of the treatment practices. As with the treatment practices, both control group practices relied on other organizations for funding and technical support, reported slowly transitioning to EHRs, and experienced problems both with the EHR's stilted language (in the templates) and system integration with other providers. One control practice did report more sophisticated use than treatment practices of some functions, such as clinical decision support and patient correspondence. The practice also reported that, due to increased efficiency, the practice was

able to reduce staff, an outcome of implementation that was not experienced by the visited treatment practices.

As with use of health IT, the care management strategies for the control practices mirrored those pursued by treatment practices, but as a whole were more integrated with the EHR, in that they used the EHR to identify and follow up with patients needing tests or services and create disease specific lists of patients requiring intervention. One practice also uses disease-specific templates and is generating educational materials directly from the EHR. Only one control practice is actively pursuing quality improvement; practice staff monitor quality of care through the EHR and review quarterly reports from insurers, and the office manager participates in weekly meetings with managers at other practices in the larger medical group to discuss quality improvement initiatives.

IV. SOUTH DAKOTA

Much of the health care in South Dakota is provided by three integrated delivery systems (IDSs) whose influence was seen in practices' response to the demonstration and implementation and use of health IT. For IDS practices, all decisions related to (1) the system-wide adoption, implementation, and use of health IT, (2) participation in the demonstration, and (3) responses to demonstration incentives, were made entirely at the IDS corporate level. Thus, although the demonstration community partner was officially responsible for demonstration outreach and recruitment, the IDS practices had no interaction with the community partner since the participation decision was made at a central administrative level (not voluntarily by practice). The major reaction of the IDSs to the demonstration incentives was to hasten the already planned EHR implementation in treatment practices to take advantage of the incentives. Other factors that might potentially influence EHR adoption and use, such as other pay-for-performance programs, the QIO, and the Regional Extension Center (REC), had very little influence. Provider awareness of the demonstration was low, but is expected to increase for at least two of the practices because providers will need to be involved with review of measures and goal setting. While overall feelings toward the demonstration were positive, practices are apprehensive about pay-for-performance in general. Three of the four visited treatment practices have implemented an EHR. IDS practices benefitted from the IDS IT leadership in the decisions noted above and in EHR implementation and use, and future use depends on the IDS and EHR vendor support. IDS practices that implement later in the schedule benefit from lessons learned from early adopter practices; for example, when one IDS practice implemented its EHR, they were still writing some of the processes, but now the IDS has a fairly standardized implementation process to use for later implementers. Care management is not currently prevalent. Plans for care management are related to implementation of automated reminders and health coaching.

A. The Community Partner and the Local Environment

Community partner role and recruitment. The community partner is a public/private partnership that includes the South Dakota Department of Health (DoH) and administrative personnel from the IDSs, among others. Recruitment of IDS practices for the demonstration was fairly smooth, as the IDSs were cooperative and interested in the demonstration, while recruitment of independent practices was more complex. The recruitment process for the independent practices involved the community partner working with the rural health association, community health association, and medical association to acquire lists of practices not associated with a larger organization. The community partner then contacted those practices directly and worked with the state medical association and QIO to recruit the independent practices. The process worked well, but there were a few difficulties. First, the state DoH does not directly license the practices, so they did not have a readily available list of practices in the state from which to pull information for recruitment, which meant creation of the list was more difficult than actual recruitment. Second, there were a number of practices that did not really understand the demonstration. Finally, they believed a longer timeframe for recruitment would have led to a better response, particularly from independent, or unaffiliated, practices. In the end, 87 practices were recruited to the demonstration, 43 of which were randomized to the treatment group and 44 to the control group.

There was a difference in recruitment ease between the IDS practices and independent practices as the IDSs already had a trusting relationship with the practices that facilitated practice involvement. The community partner utilized the medical association's relationship and level of trust with the independent practices to address this barrier to recruitment. The main issues these practices were concerned about regarded implementation and lack of up-front financial resources to invest in health IT; the community partner dealt with these concerns by stressing the inevitability of health IT and the opportunity in the demonstration to implement health IT and receive reimbursement. Overall, the community partner disseminated information and highlighted the advantages of participation, but did not have to put much time into a marketing strategy. From the perspective of the community partner, the main factors that led practices to participate in the demonstration revolved around trust in systems and incentives. The three major IDSs have all invested in health IT, which also facilitated participation.

The community partner representative did not report definite plans for working with or facilitating assistance to practices in implementing EHRs and using EHRs for care management. IDSs will provide the majority of assistance for associated practices and the medical association will assist the independent practices. The community partner believes that the REC will provide the lacking technical assistance and will draw on best practices for implementing health IT from the IDSs.

Other pay-for-performance initiatives. Our respondents mentioned only two pay-for-performance programs other than the demonstration: CMS' PQRS (really a pay-for-reporting program), and a program run by Wellmark Blue Cross.[31] The Minnesota[32] treatment practice we visited also participates in the Minnesota Community Measurement program, which is a statewide public reporting program with no payment incentives. Two treatment practices submit a few PQRS measures, while a third treatment practice had previously participated in PQRS through manual chart abstraction and anticipates resuming participation through its forthcoming EHR, which will allow electronic clinical data collection. Two of these treatment practices also participate in the Wellmark program. The one independent treatment practice does not participate in programs other than the EHR demonstration.

Other local initiatives. At the practice level, other health IT initiatives, the QIO, and the REC had negligible influence at the time of our visit. A practice administrator and a corporate administrator for one of the IDSs were aware of statewide activities: the REC was recently awarded funding, and a collaborative is working on health information exchange to construct interoperability across health IT products instead of creating a central data repository as has been done in a few other states. It is not surprising that the REC had not yet had an influence, as the program was just being launched at the time of the site visit. None of the staff at the practice level had involvement with the QIO, the community partner, or the REC; only the administrator of one of the IDSs had involvement with the QIO and community partner.

[31] Wellmark Blue Cross and Blue Shield of South Dakota is the largest health insurer in South Dakota, with 61 percent of the state market. Source: American Medical Association, "Competition in Health Insurance: A Comprehensive Study of U.S. Markets: 2008 Update."

[32] The South Dakota EHRD site includes practices in South Dakota as well as a few practices in neighboring Minnesota and Iowa.

B. Treatment Group Practices

1. Visited Practices' Structure and Staffing

In June 2010, the two-member research team visited four treatment and two control practices in eastern and western South Dakota and western Minnesota. Three of the four treatment practices and one of the two control practices were practices in much larger multi-facility integrated delivery systems (IDSs) that dominate health care in South Dakota. The remaining treatment and control practices were practices belonging to independent physician groups. Three of the treatment practices and one of the control practices have an EHR.

The treatment practices all provided primary care exclusively (family practice and general internal medicine) and were small and medium-sized: two practices had four physicians each, one practice had five physicians, and the fourth practice had two mid-level practitioners (one nurse practitioner and one physician's assistant) with no on-site physicians. At the practices with physicians, there were also one to three mid-level providers. The percent of Medicare fee-for-service beneficiaries ranged from 35 percent to 45 percent, and all treatment practices also served Medicare Advantage beneficiaries (who are not part of the demonstration). Two treatment practices were in rural areas while two were in urban settings.

2. Perspectives on the Demonstration and Early Response

Decision to participate in the demonstration. For the three treatment IDS practices, the decision to participate in the demonstration was made at the larger organizational level, and applied to all IDS locations. At the fourth treatment practice, the independent practice, the two co-office managers made the decision to participate in the demonstration. Two main influences created interest in participation: (1) the idea that the demonstration would shorten the timeframe to EHR implementation, and (2) the availability of incentives to help with funding the health IT. The independent practice also said that the knowledge that an EHR will eventually be mandatory influenced its participation, and the demonstration helped move it along on the selection and implementation of an EHR. In addition, the organizational level administrator for one of the IDSs said that, as a large provider of health care in the state, the IDS likes to be involved in opportunities like the demonstration. This administrator also cited the community partner as the leader in encouraging participation.

Awareness of the demonstration. Individual providers had little awareness of the demonstration. The administrator at one practice said that the demonstration happens behind the scenes for providers. For one IDS, to which two of the treatment practices belonged, the organizational IT department developed the OSS responses and practices only reviewed that information for accuracy. The organizational administrator believes that practices will be affected by and involved in the demonstration in the next year, when practices have to check patient lists, review quality measures, and set goals for the third through fifth years of the demonstration.

Perspectives on the demonstration. Consistent with their low awareness of the demonstration, providers at the practices did not have many particular aspects of the demonstration that they liked or disliked. The overall feeling toward the demonstration in the four practices was positive. One respondent commented that the demonstration was well planned, and liked that non-compliance or patient refusal is taken into account. The IDS

administrator for two of the practices liked the fact that practices that had already implemented EHRs were not excluded from the demonstration, which he believes is beneficial for the IDS and for the state. The only two criticisms of the demonstration came from executives of one IDS: (1) Rural Health Clinics were ineligible for the demonstration, which was problematic because exclusion of these clinics eliminated many potential participants, and (2) the response categories in the OSS (which is used to determine systems payment) were difficult to choose. For example, it was difficult to determine whether the proportion of patients for a particular function should be "none" or "3/4 or more," taking into account the variations in use that occur among providers.

Staff at the practices had no expectations of the size of the demonstration payments. Only the corporate staff of the two IDSs were aware of the payments and provided estimates of the payments; they expected to do well but did not expect to receive the maximum payments across the entire demonstration period. One practice expects that the later years of the demonstration will be smoother in regards to data collection and submission due to experience and working with the EHR vendor on data collection; in the final two years of the demonstration, they believe that "just being able to extract the data" will determine their payments. The administrator for one IDS noted that a recent EHR upgrade would provide additional support for care planning (an area in which they did not score well during the baseline period), which will improve their performance in the demonstration.

Early response to the demonstration. None of the treatment practices has done much in response to the demonstration. Staff at two practices said that the demonstration has not caused changes yet, although respondents at the one practice without an EHR said that the demonstration has drawn greater attention to the importance of the upcoming EHR and to the expectations for accountability and disease management. The staff at the independent treatment practice said that it would have implemented an EHR without the demonstration and that the demonstration will only help offset the cost of the product (rather than covering its full cost). Two treatment practices with EHRs, both practices belonging to one IDS, noted minor changes due to the demonstration: one practice was moved up in the existing implementation schedule and the other reported it received more functionality more quickly due to the demonstration carrying weight with its EHR vendor (meaning the vendor viewed the demonstration as important when making decisions about which functionalities to add and when to add them).

Perspectives on pay-for-performance. Some respondents at practices were apprehensive about pay-for-performance in general. The most concerns were related to aspects of quality outside of the providers' control, such as patient compliance and specialists' care. However, one physician said that it is reasonable to hold him accountable for things in his control. Specific concerns included the following:

- The idea that many things should be taken into account when designing a payment scheme, for example, patient non-compliance or refusal, practice and patient location (rural versus inner city versus suburbia), and language or cultural barriers (staff at one practice noted this concern).
- The future possibility of programs incorporating penalties in addition to positive incentives for performance from programs such as this demonstration (two practices).
- The theoretical possibility of non-compliant patients being turned away. (Staff that were interviewed at each treatment group practice agreed with this but did not think that that would actually happen in their own practice locations. A few people

cautioned, though, that providers may interact with less desirable patients in ways that subtly push away those patients.)

- Pay-for-performance programs may take away from the physicians' focus on the patient, particularly in small practices that do not have non-physician staff to operate the program and would need to rely on physicians for pay-for-performance administrative work (one practice).
- Concern about who would pay for the infrastructure (for example, data collection/submission and program administration) for such programs (one practice).

Finally, the idea that pay-for-performance programs might detract attention from non-measured care activities was not an issue for our respondents. As staff at one IDS practice explained, there is a baseline focus on everything the providers and staff should do, and practices can then spend additional resources to focus on program activities without taking away from other activities.

3. Health IT Use and Plans

Influence of the demonstration and other incentives on health IT use and plans. As noted above, the demonstration's influence on health IT adoption and use was minor. In two treatment practices, one IDS practice, and the independent practice, the demonstration shortened the timeframes for implementation. In addition, two practices' health IT use and planning was affected by the availability of other incentives such as the "meaningful use" incentives. In one practice, the "meaningful use" incentives considerably affected planning: it affected the implementation timeframe and selection of the EHR. In the other practice, the financial burden of the EHR and the availability of incentives to recoup some of the cost were key factors in early implementation of the system. The organization level administrator for the two other IDS practices said that the response to "meaningful use" will be on the corporate level and will be driven by the EHR vendor.

Use of EHRs. Three of the four visited treatment practices have EHRs. The IDS practices implemented the EHR one and two years prior to the demonstration start, and are fairly advanced in their use of the EHR. The EHR vendor develops upgrades based on requests from all of the vendor's clients nationwide. In addition to basic functions, the practices use the EHR to: manage patient care (for example, track patient care on flow sheets); order and view laboratory tests, imaging, and referrals electronically; create lists of patients by criteria; and view graphs of patient information such as vital signs and test results. They also use e-prescribing through the EHR, and have reminders for overdue tests or exams in the EHR. Patients have some electronic access, but that function is not widely used by patients.

The independent practice with an EHR implemented it five months prior to our visit. It is still learning how to make full use of the product, and still uses paper charts occasionally in addition to the EHR. This practice regularly uses the following functions of the EHR: templates, e-prescribing, and electronically ordering and reviewing laboratory tests. They are not yet able to use more advanced functions such as automatic reminders of overdue tests or exams (although staff can manually review this information in the EHR), or creating lists of patients by criteria.

Facilitators. Respondents noted a few facilitators to EHR implementation and use. Vendor support was important to all three practices with EHRs, particularly for the independent practice

that did not have the extensive corporate IT support that the two IDS practices were also able to rely on. When adopting the EHRs, all three practices relied on vendor technical assistance, and those associated with a larger organization also received a great deal of leadership from the organizational level staff. With each implementation for the organization, the amount of time to implement decreases due to the lessons learned with previous locations, a benefit to those practices associated with a larger organization. When searching for an EHR product, corporate staff at one of the larger health systems also received guidance from a consultant about designing its IT use as an integrated delivery system. The IDS encourages provider input into configuring and customizing the EHR, which one practice manager said has strengthened the clinical appropriateness of the EHR compared to the version originally implemented.

Barriers. Respondents also identified a few barriers to EHR use. The staff interviewed at the independent practice noted that staff lacked such basic IT skills as typing and were overwhelmed by turning on all functions at the same time. The practice had also purchased a vendor package that was inappropriate for their practice. (After purchase, they were told that another package that would have required less customization of the system by the practice and would have had different training options would have been more appropriate.) The vendor assistance and training has been vital to overcoming these barriers, but the costs and limitations of the available training are a continuing problem with the inappropriate vendor package. The main issue at the two other practices was a struggle with clinical documentation, for example, setting up templates and uncertainty about the level of detail to include in the chart and where specific items should be documented.

Changes in the practices due to health IT. Implementation of the EHRs created a variety of changes for the practices related to workflow, job responsibilities, and patient experience. The EHR caused workflow in all three treatment practices to change. The independent practice said "everything" changed regarding care and flow, from when patients call to actual visits, and that they are still finalizing the new workflow. The two IDS practices did not provide specific examples of workflow change, but the organization administrator provided insight into the IDS implementation process: the corporate staff conducts a pre-implementation assessment of processes and clinical flows and provides action plans and training to ensure the practice is adhering to the organization's standard practice visit flow. Both practices said that implementation initially slowed visit time but that information is now more easily accessible at the point of service. Job responsibilities also changed for both practices; for example, in one practice, the physicians' and nurses' jobs are easier due to a recent upgrade that improved ease of use of the EHR (for example, addition of a button to toggle between two active pages), although patient online access has increased physicians' workloads slightly, while in the other practice the EHR has increased the time spent on documentation. Finally, the patient experience has changed at all three practices because of less face-to-face interaction with providers, the availability of online access to personal health records, online communication with providers, and immediate x-ray viewing (for example, patients enjoy seeing their x-rays electronically immediately after the x-rays are taken).

Future plans for health IT. The IDS practices will rely mostly on the vendor and organization for refinements to the EHR through yearly upgrades, while the independent practice

has specific plans for their EHR. The independent practice expects to begin use of Dragon NaturallySpeaking© software,[33] further standardize EHR documentation, and implement health management (including clinical guidelines and reminders for tests and exams) and analytics functionalities.

The one treatment practice that does not have an EHR, an IDS practice, expects to implement its EHR in September 2010. This practice has started preparing for implementation: providers can access e-learning modules and staff have created a chart extraction plan to build patient electronic charts before system implementation for patients with pre-existing conditions. This practice will benefit from implementation lessons learned by other practices in the IDS that have already implemented the EHR. These lessons, along with providers' openness to the EHR, vendor training prior to the go-live, and vendor on-site support the first few weeks of implementation, will facilitate the transition to the EHR. The practice also identified a few barriers to implementation, which they have worked to overcome: (1) getting the hospital system and practice system to work together (primarily by building a master patient index); (2) nursing staff apprehension about the transition because the nurses cannot envision how their roles will change (will be addressed by streamlining paperwork); and (3) patients' resistance such as not wanting to fill out paperwork to collect complete information for the EHR and patients not liking the fact that their provider is using a computer during visits (will be overcome by staff that will assist patients with paperwork).

4. Current and Planned Care Management Strategies

Current strategies. Current care management is not prevalent in the four visited treatment practices. All four are doing patient reminders of some sort by checking charts at patient visits for tests or exams that are due, when patients call for refills, or in order to do call backs. Two practices each have support groups or education for diabetic patients, flag or list diabetic patients, and work with other providers (such as outside ophthalmologists) to capture information related to care such as eye exams. One practice reviews patients' medications lists at each visit. In one of the treatment IDS practices, the IDS was implementing an innovative health coaching disease management program combined with a patient registry product, on top of the IDS's existing EHR. Plans for this new health coaching program predated the demonstration, and the program was being implemented in one of the IDS control practices as well.[34]

Plans for care management. Plans for care management varied widely and fall under two categories: automated reminders and health coaching. The IDS practice that does not currently have an EHR expects that when it implements the EHR, the system will check for overdue tests or exams. The independent practice will start to use the health management "tab" of the EHR (which will include guidelines and reminders), and will set up routines to maximize use of that

[33] Dragon NaturallySpeaking© is an electronic dictation tool that providers can use to record clinical notes, often in conjunction with an EHR.

[34] The health coaching program seems to be motivated by both the IDS and the individual practices. The IDS does not currently have dedicated funding for health coaches, but the coaching option is open to whichever locations will pay for it. In the control practice at least, the decision to participate in this option was made by the director and vice president.

function once staff know how to fully use the EHR. One of the IDS practices that has started a health coaching program would like to expand and improve the program, while the other treatment practice in the same IDS hopes to implement health coaching in its location. These plans predated the demonstration. Practices' ability to enact their care management plans will depend on their ability to implement the EHR or improve their use of the EHRs. For those practices belonging to an IDS, the larger organization also will influence their future care management.

5. Quality Measurement

Practices are participating in few quality measurement programs other than the demonstration, and available measures in those programs are limited to those regarding diabetes. Three practices receive diabetes quality measures information beyond the demonstration, two through the Wellmark program, and one through Minnesota Community Measurement. Benchmarks are available from Minnesota Community Measurement, in which performance of all large physician group practices in the state is publicly reported.

In addition to the external quality programs, the practices were pursuing internal quality measurement efforts as well. The organizational administrator for one IDS noted that the IDS has created its own system-wide evidence-based, board of governors-approved standards, and one of the practices in this IDS will expand its data collection to include the results of depression screening for all patients (now a part of Minnesota Community Measurement). The other IDS, which includes the treatment practice that does not currently have an EHR, has the most concrete plans for additional quality measurement. The organization is developing internal goals and related quality measures will be included on the intake section of its forthcoming EHR. The organization will start additional data collection for CAD, asthma, childhood vaccines, and generic drug use, and will have a pay-for-performance page in the EHR to collect payer-specific quality reporting information. Staff at the independent practice who are still learning to use the EHR hope to do reporting through the analytics section of their EHR when they have that function working.

C. Control Group Practices

As already mentioned, EHR and care management activities at the two visited control group practices reflected either the larger organization's corporate plans in the first instance, or the general practice environment for independent practices in the other. The first control group practice is an IDS practice. It has already been using an EHR for approximately four years, and is in the process of implementing the same health coaching program as the program described earlier at one of its treatment group counterparts in the same IDS. In fact, one of practice administrators we interviewed oversees both this control group IDS practice and one of the treatment group practices (although a different treatment group practice than the one implementing the health coaching program). The other control group practice is an independent practice belonging to a medium-sized multi-specialty physician group practice. This independent practice is nearing the end of the investigational stage of acquiring an EHR and hopes to have the system in place by the first quarter of 2011. There were no major differences that stood out between the treatment and control practices that would influence their responses to the demonstration and other incentives. Again the key determinant of EHR adoption and use was membership in an IDS and corporate decision making by the central IDS administration.

REFERENCES

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APPENDIX A: OFFICE SYSTEMS SURVEY DETAILS

1. Office Systems Survey (OSS) Instrument
2. OSS Scoring Method
3. Survey Results for Each OSS Function Measured
4. OSS Scores of Practices Eligible for Demonstration Payments

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APPENDIX A1

OFFICE SYSTEMS SURVEY (OSS) INSTRUMENT

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OMB Approval No.: xxxx-xxxx
Expiration Date: xx/xx/xxxx

MATHEMATICA
Policy Research, Inc.

Electronic Health Records Demonstration

Office Systems Survey

April 1, 2009

Thank you for participating in the Centers for Medicare & Medicaid Services (CMS) Office Systems Survey (OSS). This survey is being conducted as part of the Electronic Health Records Demonstration (EHRD) and its evaluation. The goal of this demonstration is to unite technology and clinical practice in the physician office setting. The evaluation of the EHRD will help CMS develop additional programs that can assist physicians in moving toward the common goal of improving care. This is a unique opportunity for your practice to contribute to a large-scale effort to improve the quality of ambulatory health care.

The survey asks about three types of health information technology (HIT) that you may be using in your practice to help manage your patients' health needs. The survey will first ask if your practice is currently using or is in the process of obtaining:

- An Electronic Health Record (EHR) system
- A stand-alone electronic patient registry
- A stand-alone electronic prescribing system

The survey will then collect information about the **functions** of the systems you currently using.

Please complete all sections of the survey unless directed within it to skip a section. *If you are not aware of how all the providers in the practice are using the functions asked about in the survey, please consult with them prior to answering the questions.*

Again, we thank you for taking the time to fill out this important survey.

SECTION 1 - General Information – Practice

{MERGE} F IELDS INDI CATE DAT A THAT W ILL BE FILLED IN BA SED ON RESPONSE TO THE DEMONSTRATION APPLICATION OR A PREVIOUS OSS.

1.1. Date:

1.2. EHRD Assigned Practice ID Number: {MERGE FIELD}

Please review your practice information below for accuracy. **Please make corrections where necessary.**

1.3. Legal Name of Practice {MERGE FIELD}

1.4. Locati on Address: {MERGE FIELD} Add a second line as in IPG web form

1.5. Location City: {MERGE FIELD}

1.6. Location State {MERGE}

1.7. Locatio n Zip Code: {MERGE FIELD}

1.8. Telephone No.: {MERGE FIELD}

1.9. Fax No.: {MERGE FIELD}

1.10. E-mail Address: {MERGE FIELD}

1.11. Federal Tax ID for this practice: {MERGE FIELD}

1.12. Please check here if all of the above information is correct. ☐

1.13. Is your practi ce affiliated with an Indep endent Pra ctice Asso ciation (I PA), Physi cian Ho spital O rganization (PHO) or other medical group?

☐ Yes *Please proceed to question 1.14*

☐ No *Please proceed to question 1.15*

1.14. Please indicate which type(s) of organization(s) your practice is affiliated with: {MERGE FIELD FROM PRIOR OSS RESPONSE; NOT COLLECTED ON APPLICATION}

☐ IPA (please specify) _____

☐ PHO (please specify) _____

☐ Community health center (please specify) _____

☐ Academic medical center (please specify) _____

☐ Owned by a hospital, hospital system or integrated delivery system (please specify) _____

☐ Owned by a larger medical group (please specify)_____

☐ Other (please specify) _____

1.15 Is your practice **currently** participating in any of the following programs? Please check all that apply

	Physician Quality Reporting Initiative (PQRI)
	Bridges to Excellence (BTE)
	Doctors Office Quality Information Technology (DOQIT) Warehouse submissions
	State or regional public reporting group
	Other private sector electronic health records (EHR) demonstrations or initiatives *(please name, and include the sponsoring insurer or employer)*:
	Other federal quality improvement initiatives including pay-for-performance *(please name)*:
	State or other publicly funded quality improvement initiatives including pay-for-performance or Medicaid IT initiatives *(please name)*:
	Private quality improvement initiatives including pay-for-performance *(please name)*:
	Other similar programs *(please name)*:
	None of the above
	Do not know

SECTION 2 – Provider Profile

The following information comes from [your practice's EHRD application form/AFTER YEAR 1 THIS WILL READ: the most recent practice information you provided for the EHR demonstration]. Please review the information below for accuracy and **make corrections or additions where necessary.**

Please note that provider identifiers are being requested in this survey to ensure that the correct information is associated with the practice. The information you provide will be used by CMS internally, only for the purposes of the EHRD and its evaluation. This information will not be shared or disseminated outside of the project staff.

2.0a. The number of providers currently participating in the demonstration is____ [MERGE FIELD] _____.

Is that correct?

☐ Yes *Please proceed to instructions in bold below*

☐ No *Please proceed to question 2.0b*

2.0b. What is the correct number of participating providers? _____

Please verify the information below for each primary care provider participating in the demonstration who works at this practice location. (By primary care providers we mean: primary care physicians, specialty physicians practicing primary care, and physician assistants and nurse practitioners practicing primary care who bill Medicare independently, as enumerated in 2.0b or c).

Please note at the bottom of each box whether a previously mentioned provider has left the practice and the date of that departure, or a new provider has joined the practice and is participating in the demonstration and the date the provider joined the practice.

** ALL FIELDS BELOW WILL BE POPULATED WITH DATA FROM THE APPLICATION FORM, LAST OSS, OR MOST RECENT DATA FROM ARC – WHICHEVER IS MOST RECENT.

THE WEB PROGRAM WILL INCLUDE ENOUGH BOXES TO CAPTURE ALL THE LOCATION'S PARTICIPATING PROVIDERS' INFORMATION

2.1. First Name	2.2. MI	2.3. Last Name
2.4. Individual (NPI) National Provider Identification Number		
2.5. Credentials (MD, DO, NP, PA)	2.6. Specialty [1] 2.7. If other, please specify	2.8. Language(s) spoken (other than English)
2.9. Provider's Primary Practice Location (Y/N) [2] Ye s	2.10. PIN # (Individual Medicare Billing Number) [3] No	
2.11. Please check here if all of the above is correct. ☐ Please check here if any information was incorrect, and make necessary corrections ☐ Please check here if this provider left the practice in the last year Date of departure _____ Please check here if this provider is new to the practice in the last year Date joined practice_____		

2.1. First Name	2.2. MI	2.3. Last Name
2.4. Individual (NPI) National Provider Identification Number		
2.5. Credentials (MD, DO, NP, PA)	2.6. Specialty [1] 2.7. If other, please specify	2.8. Language(s) spoken (other than English)
2.9. Provider's Primary Practice Location (Y/N) [2] Ye s	2.10. PIN # (Individual Medicare Billing Number) [3] No	
2.11. Please check here if all the information is correct. ☐ Please check here if any information was incorrect, and make necessary corrections ☐ Please check here if this provider left the practice in the last year Date of departure _____ Please check here if this provider is new to the practice in the last year Date joined practice_____		

[ADDITIONAL BOXES WILL BE AVAILABLE AS NEEDED]

Footnotes:

1 Please use the following codes to indicate specialty: Cardiology (C); Endocrinology (E); Family Practice (F); Geriatrics (G); Internal Medicine (I); Other (please specify)

2 Please indicate whether the provider listed primarily practices at this office location (that is, sees 50% or more of his or her patients primarily at this location).

3 Please provide the Individual Medicare Billing Number (PIN) that is assigned by the Medicare Carrier in your state for use by this provider at this practice location only. (HCFA 1500 form field 24K or 33).

2.12 What is the total number of providers currently working at this practice in this location? (Please include all primary care physicians, specialty physicians, physician assistants, nurse practitioners, and nurse midwives, including those who are participating in the demonstration, as well as those who are not eligible for or not participating in the demonstration. Please exclude residents and fellows.) _____

NOTE THAT THE REMAINDER OF THE SURVEY PERTAINS TO THE TOTAL NUMBER OF PROVIDERS (NOT JUST THOSE PARTICIPATING IN THE DEMONSTRATION) AND TO ALL PATIENTS SEEN BY THOSE PROVIDERS (NOT JUST THOSE ON MEDICARE).

SECTION 3 - Use or Planned Use of Electronic Health Records, an Electronic Patient Registry, or an Electronic Prescribing system

A. Electronic Health Records

An Electronic Health Record (EHR) is a longitudinal electronic record of patient health information generated by one or more encounters in any care delivery setting. This record may include patient demographics (for example, age or sex), diagnoses, progress notes, problems, medications, vital signs, past medical history, immunizations, laboratory data, and imaging reports.

An EHR system has the capability of generating a complete record of a clinical patient encounter, as well as supporting other care-related activities, such as evidence-based decision support, quality management, and outcomes reporting. *(The EHR covers all conditions that the patient might have, as distinct from a registry that covers a specific disease or a limited set of diseases).* A practice management or billing system is not an EHR system.

Implementation of specific functions within an EHR system may vary based on the goals set by a practice and could include: entering progress notes; providing decision support within the patient encounter; and utilizing computerized physician order entry for laboratory tests and prescriptions.

This subsection (A) asks about the use (or planned use) of an EHR system in this practice location. (Subsection B will ask about electronic patient registries, and Subsection C will ask about electronic prescribing.)

3.1	Has your practice implemented an EHR in this location? (By "implemented" we mean an EHR has been purchased, installed, and tested, and is currently being used.)
	☐ **Yes** *Proceed to question 3.3* ☐ **No** Proceed to question 3.2
3.2	When do you plan to implement an EHR at this practice location? ☐ 0-6 months ☐ 7-12 months ☐ 13-24 months ☐ other _____
	If you answered No to question 3.1, please proceed to Subsection B, Electronic Patient Registry

	If you answered Yes to 3.1, please answer questions 3.3-3.6.
3.3	When did the practice purchase the current EHR from the vendor? _____(mm/dd/yy)
3.4	What is the vendor name, product name, and version of the EHR system you currently have at this practice location? _____ _____
3.5	Is the EHR system certified, or has it ever been certified, by the Certification Commission for Healthcare Information Technology (CCHIT)? (http://www.cchit.org) ☐ **Yes** *Please proceed to question 3.5a* ☐ **No** *Please proceed to question 3.6*
3.5a	In what year was the EHR system certified? (If more than one year, indicate the most recent year.) _____(yyyy) ☐ **Don't know**
3.6	Are you currently *using* the system in this practice location? (By "use" we mean use for purposes *related to patient care*. If the system is used solely for practice management or billing, please respond "no.")
	☐ **Yes**
	☐ **No** Please proceed to question 3.8

3.7 How many of the [FILL IN FROM 2.12] providers in this practice location *currently use* the practice's EHR system? _____ (By "use" we mean using for any purpose or functions.)

The total number of providers includes primary care physicians, specialty physicians, physician assistants, nurse practitioners, and nurse midwives (including those who are participating in the demonstration, as well as those who are not eligible for or not participating in the demonstration) as enumerated in 2.12.

3.8 Have you received any technical assistance on the adoption of the EHR system or other health information technology (HIT)?

☐ Yes *Please proceed to question 3.8a*
☐ No *Please proceed to Subsection B, Electronic Patient Registry*

3.8a IF YES: Where did you receive this technical assistance from? Please check all that apply.

	DOQ-IT University
	Quality Improvement Organization (QIO)
	Health Information Technology Adoption or e-health Initiative
	EHR vendor (please specify):
	Private consultant
	Larger organization that owns this practice
	Other (please name):

B. Electronic Patient Registry

For purposes of this survey, an electronic patient registry is defined as an electronic system, either a component of an EHR or a stand-alone system that is designed to: identify patients with specific diagnoses or medications; identify patients overdue for specific therapies; facilitate prompt ordering of specific laboratory tests or recommended drugs; and facilitate prompt communication with patients requiring follow-up. A stand-alone registry is a separate electronic system from an EHR system. (It may also be referred to as a patient e-registry.)

For example, a practice may use a registry for its diabetes patients to document care at visits, and to create reports that indicate which patients are due for certain blood tests, or are not meeting specific treatment goals for diabetes. A registry may also be used to ensure all suggested preventive screenings take place.

These next questions ask about the use of electronic registries in your practice.

If this practice location has NOT implemented an EHR (that is, you answered "no" to 3.1), please proceed to 3.9b.

3.9a Has your practice at this location implemented an EHR (rather than a stand-alone patient registry) to perform registry functions, such as tracking patients who have a specific chronic illness, or receive preventive care (that is, immunizations, mammography and other cancer screening) for at least one condition? (By "implemented" we mean an EHR has been purchased, installed, and tested, and is currently being used.)

☐ **Yes** *Please proceed to Question 3.13*
☐ **No** *Please proceed to Question 3.9b*

3.9b Has your practice at this location implemented a stand-alone patient registry to track patients who have a specific chronic illness, or receive preventive care (that is, immunizations, mammography and other cancer screening) for at least one condition? (By "implemented" we mean an EHR has been purchased, installed, and tested, and is currently being used.)

☐ **Yes** *Please proceed to Question 3.9c*
☐ **No** *Please proceed to Question 3.14*

3.9c Is this stand-alone patient registry linked with your EHR system? That is, do you electronically update the registry from the EHR system?

An electronic update may include regularly running a program to transfer data from the EHR to the registry.

☐ **Yes**
☐ **No**

3.10 When did the practice purchase the current stand-alone patient registry from the vendor?

_____(mm/dd/yy)

3.11 What is the vendor name, product name, and version of the stand-alone patient registry that you currently have at this practice location?

_____

_____

3.12 Are you currently *using* the stand-alone patient registry system at this practice location? (By "use" we mean use for purposes *related to patient care*. If the system is used solely for practice management or billing, please respond "no.")

☐ **Yes** *Please proceed to question 3.13*
☐ **No** *Please proceed to Subsection C, Electronic prescribing*

3.13 For which of the following conditions is your EHR system (or stand-alone patient registry) being used to manage patient care?

By "manage patient care" we mean using the electronic system to help improve care for patients with a specific diagnosis or condition. This often occurs, for example, through the use of electronic clinical reminders or other informational or decision supports within the EHR or registry, or by the EHR or registry's making it possible to do targeted outreach to patients with the condition.

a. Diabetes	☐ Yes	☐ No	f. Adult Asthma	☐ Yes	☐ No
b. Coronary Artery Disease	☐ Yes	☐ No	g. Depression	☐ Yes	☐ No
c. Hypertension	☐ Yes	☐ No	h. Anticoagulation	☐ Yes	☐ No
d. Congestive Heart Failure	☐ Yes	☐ No	i. Other	☐ Yes	☐ No
e. Preventive Care	☐ Yes	☐ No	**If other, please specify:** _____		

_____

If you answered no to question 3.9b, please answer question 3.14. All others please proceed to Subsection C, Electronic Prescribing System

3.14 When do you plan to implement a patient registry system, either within an EHR or as a stand-alone system, at this practice location? ☐ Do not plan to implement one ☐ 0-6 months ☐ 7-12 months ☐ 13-24 months ☐ other _____

C. Electronic Prescribing System

Electronic prescribing tools are designed to generate prescriptions and to conduct other functions related to medication prescribing. They may either be components of an EHR or stand-alone system and sometimes include hand-held devices.

The next series of questions ask to what extent your practice uses an electronic prescribing tool and whether that tool is a stand-alone or part of your EHR.

If this practice location has NOT implemented an EHR (that is, you answered "no" to 3.1), please proceed to 3.15b.

3.15a Has your practice at this location implemented an EHR to generate prescriptions? (By "implemented" we mean an EHR has been purchased, installed, and tested, and is currently being used.)

☐ **Yes** *Please proceed to Section 4, Electronic System Functions*
☐ **No** *Please proceed to Question 3.15b*

3.15b Has your practice at this location implemented a stand-alone electronic prescribing system to generate prescriptions? (By "implemented" we mean an EHR has been purchased, installed, and tested, and is currently being used.)

☐ **Yes** *Please proceed to Question 3.15c*
☐ **No** *Please proceed to Question 3.19*

3.15c Is this stand-alone prescription system linked with your EHR system? That is, do you electronically update the prescription system from the EHR system?

An electronic update may include regularly running a program to transfer data from the EHR to the e-prescribing system.

☐ **Yes**
☐ **No**

3.16 When did the practice purchase the current stand-alone prescribing system? _____ (mm/dd/yy)

3.17 What is the vendor name, product name, and version of the stand-alone prescribing system you currently have at this practice location?

____ _____

____ _____

3.18 Are you currently *using* the stand-alone prescribing system at this practice location? (By "use" we mean use for purposes *related to patient care*. If the system is used solely for practice management or billing, please respond "no.")

☐ **Yes** *Please proceed to Section 4, Electronic System Functions*
☐ **No** *Please proceed to Section 4, Electronic System Functions*

If you answered no to question 3.15b, please answer question 3.19. All others please proceed to section 4

3.19 When do you plan to implement an electronic prescribing system, either within an EHR or a free-standing system? ☐ Do not plan to implement one ☐ 0-6 months ☐ 7-12 months ☐ 13-24 months

☐ other _____

If this practice location has NOT implemented an EHR, has NOT implemented an electronic patient registry, AND has NOT implemented an electronic prescribing system (that is, you answered "no" to 3.1 AND 3.9b AND 3.15b), please proceed to Section 5. All others please continue to Section 4, question 4.1.

SECTION 4 – Electronic Health Record, Patient Registry, and Prescribing System Functions

An EHR system has the capability of generating a complete record of a clinical patient encounter, as well as supporting other care-related activities, such as evidence-based decision support, quality management, and outcomes reporting. An EHR system can have many functions such as: entering progress notes; providing decision support within the patient encounter; and utilizing computerized physician order entry for laboratory and prescriptions. Electronic patient registries and electronic prescribing systems may perform some of these functions.

Domain 1. Completeness of Information

		PROPORTION OF PAPER RECORDS/CHARTS				
4.1 Please estimate the proportion of…		None	Some, but less than ¼	1/4 or more, but less than 1/2	1/2 or more, but less than ¾	3/4 or more
4.1a	Paper records that have been transitioned to the EHR system. By "transitioned" we mean either scanned documents in full into the EHR or keyed in data items by hand (such as patient demographics, medical history, blood pressure readings, test results)					
4.1b	Paper charts that were pulled for scheduled patient visits over the past month					

If response to 4.1a = "None", please proceed to next section below. For all other responses to 4.1a, please proceed to question 4.1c

4.1c What method did you predominantly use to transition your paper records to the EHR system? Was it to scan documents in full into the system, key in the data items by hand, a combination of both, or some other method?

- ☐ **Scan documents in full**
- ☐ **Key in data items by hand**
- ☐ **Combination of scanning and keying in items**
- ☐ **Other, please specify:** _____

_____

Domain 1. Completeness of Information (Cont.)

This section asks about the extent to which your practice uses an EHR system, electronic patient registry, or electronic prescribing system for maintaining different types of patient data.

When responding please refer to patients seen over the past month by ALL providers in this practice location, or by other office staff acting on behalf of those providers. When the item is about using a function for a subset of patients – such as those needing imaging studies – please refer to the proportion of relevant patients.

By "all providers" we mean all the primary care physicians, specialty physicians, physician assistants, nurse practitioners, and nurse midwives in this practice location (including those who are participating in the demonstration, as well as those who are not eligible for or not participating in the demonstration) as enumerated in 2.12.

Please estimate the proportion of patients for which providers (or others acting on their behalf) at this practice location use the EHR, electronic patient registry, or electronic prescribing system for each of the following functions (as opposed to relying on paper charts).

	PROPORTION OF PATIENTS				
Functions	**None**	**Some, but less than ¼**	**1/4 or more, but less than 1/2**	**1/2 or more, but less than ¾**	**3/4 or more**
4.1d. Clinical notes for individual patients *Refers to using the electronic system to create, update, store and display clinical notes.*					
4.1e. Allergy lists for individual patients *Refers to using the electronic system to create, update, store and display a list of medications or other agents (food, environmental) to which patient has a known allergy or adverse reaction.*					
4.1f. Problem or diagnosis lists for individual patients *Refers to using the electronic system to create, update, store and display a list of problems or diagnoses for a patient.*					
4.1g. Patient demographics (for example, age or sex) *Methods of entry include direct keyboard entry (typing); entering notes/data using templates, forms or drop-down menus; or dictation with the voice transcribed manually or via voice recognition into text that is later integrated into the system.*					
4.1h. Patient medical histories					
4.1i. Recording (or entering) laboratory orders into electronic system *Methods of entry include direct keyboard entry (typing); entering notes/data using templates, forms or drop-down menus; or dictation with the voice transcribed manually or via voice recognition into text that is later integrated into the system.* *Includes orders for lab tests conducted by external providers and the practice itself.*					

Functions	None	Some, but less than ¼	1/4 or more, but less than 1/2	1/2 or more, but less than ¾	3/4 or more
4.1j. Receivi ng labo ratory results by fax or mail and scanning paper versions into electronic system *Refers to converting the image or text from paper into a digital image or text that is saved in the electronic system.* *Includes results from lab tests conducted by external providers and the practice itself.*					
4.1k. Reviewing laboratory test results electronically *Refers to (1) system tracking that results have been received and (2) physician examining screens with displays of results stored in the system.*					
4.1l. Re cording (o r e ntering) ima ging orde rs i nto electronic system *Methods of entry include direct keyboard entry (typing); entering notes/data using templates, forms or drop-down menus; or dictation with the voice transcribed manually or via voice recognition into text that is later integrated into the system.* *Includes orders for imaging conducted by external providers and the practice itself.*					
4.1m Re ceiving imagin g results by fax or mail and scanning paper versions into electronic system *Refers to converting the image or text from paper into a digital image or text that is saved in the electronic system.* *Includes results from imaging conducted by external providers and the practice itself.*					
4.1n. Reviewing imaging results electronically *Refers to (1) system tracking that results have been received and (2) physician examining screens with displays of results stored in the system.*					
4.1o. Recording that instructions or educational information were given to patient *[This question will be asked for each CAD, HF, diabetes, and preventive diagnosis identified in question 3.13]*					
4.1p Re cording (or ente ring) prescri ption medications (new prescriptions and refills) into electronic system *Methods of entry include direct keyboard entry (typing); entering notes/data using templates, forms or drop-down menus; or dictation with the voice transcribed manually or via voice recognition into text that is later integrated into the system.*					

Domain 2: Communication of Care Outside the Practice

This section asks about the extent to which your practice uses an EHR system, electronic patient registry, or electronic prescribing system for **communication with providers outside the practice**. Providers outside the practice include those that are part of a larger organization or network with which the practice is affiliated.

When responding, please refer to all patients seen **over the past month** with certain conditions by ALL providers in this practice location, or by other office staff acting on behalf of those providers.

By "all providers" we mean all the primary care physicians, specialty physicians, physician assistants, nurse practitioners, and nurse midwives in this practice location (including those who are participating in the demonstration, as well as those who are not eligible for or not participating in the demonstration) as enumerated in 2.12.

Please estimate the proportion of patients for which providers (or others acting on their behalf) at this practice location use the EHR, electronic patient registry, or electronic prescribing system to perform each of the following functions (as opposed to relying on paper charts).

	PROPORTION OF PATIENTS				
Functions	**None**	**Some, but less than ¼**	**1/4 or more, but less than 1/2**	**1/2 or more, but less than ¾**	**3/4 or more**
Laboratory Orders					
*Items 4.2a -2b, and -2c form a hierarchy of laboratory ordering functions, ordered by degree of technological sophistication. Your responses to the three questions should represent the experience of all patients in your practice at this location **who needed laboratory work** over the past month.* *If the range of proportions given for these three questions sum to more than 1, a pop up box will appear that asks you to review your responses for accuracy and make any corrections as needed.*	** (If responses to the three items below sum to more than 1, a pop up box will appear that says, "The range of proportions that you responded to these three items sum to more than 1. Please review your responses for accuracy and revise any as needed.")*				
4.2a Print and fax laboratory orders to facilities outside the practice *Order is first printed and then sent over a telephone line using a stand-alone fax machine.*					
4.2b Fax laboratory orders electronically from system, or order electronically through a portal maintained by facilities outside the practice *Order is generated electronically, using a macro or template, and faxed directly through the electronic system to the laboratory or ordered directly without using any paper or a stand-alone fax machine.*					
4.2c Transmit laboratory orders electronically directly from system to facilities outside the practice that have the capability to receive such transmissions *Order is sent as machine-readable data.*					
Imaging Orders					

Functions	None	Some, but less than ¼	1/4 or more, but less than 1/2	1/2 or more, but less than ¾	3/4 or more
*Items 4.2d,-2e, and -2f form a hierarchy of imaging ordering functions, ordered by degree of technological sophistication. Your responses to the three questions should represent the experience of all patients in your practice at this location **who needed imaging** over the past month.* *If the range of proportions given for these three questions sum to more than 1, a pop up box will appear that asks you to review your responses for accuracy and make any corrections as needed.*	*(If responses to the three items below sum to more than 1, a pop up box will appear that says, "The range of proportions that you responded to these three items sum to more than 1. Please review your responses for accuracy and revise any as needed.")*				
4.2d Print and fax imaging orders to facilities outside the practice *Order is first printed and then sent over a telephone line using a stand-alone fax machine.*					
4.2e Fax imaging orders electronically from system, or order electronically through a portal maintained by facilities outside the practice *Order is generated electronically, using a macro or template, and faxed directly through the electronic system to the imaging facility without using any paper or a stand-alone fax machine.*					
4.2f Transmit imaging orders electronically directly from system to facilities outside the practice that have the capability to receive such transmissions *Order is sent as machine-readable data.*					
Laboratory Results					
*Items 4.2g -2h and –2i form a hierarchy of inputting laboratory results into an EHR system, ordered by degree of technological sophistication. Your responses to the three questions should represent the experience of all patients in your practice at this location **who received laboratory results** over the past month.* *If the range of proportions given for these three questions sum to more than 1, a pop up box will appear that asks you to review your responses for accuracy and make any corrections as needed.*	*(If responses to the three items below sum to more than 1, a pop up box will appear that says, "The range of proportions that you responded to these three items sum to more than 1. Please review your responses for accuracy and revise any as needed.")*				
4.2g Transfer electronic laboratory results (received in non-machine readable form, such as an e-fax) directly into system *Refers to saving or attaching an electronic submission, such as an e-fax, that is not electronically searchable in the EHR system. (An e-fax is a transmission of the image of a document directly from a computer or multi-purpose printer without the use of stand-alone fax equipment to generate the paper-based image.)*					
4.2i Receive electronically transmitted laboratory results directly into system from facilities that have the capability to send such transmissions *Results are received electronically and do not need to be manually uploaded or posted into the system.*					

Functions	None	Some, but less than ¼	1/4 or more, but less than 1/2	1/2 or more, but less than ¾	3/4 or more
Imaging Results					
*Items 4.2j -2k, and -2l form a hierarchy of inputting imaging results into an EHR system, ordered by degree of technological sophistication. Your responses to the three questions should represent the experience of all patients in your practice at this location **who received imaging results** over the past month.* *If the range of proportions given for these three questions sum to more than 1, a pop up box will appear that asks you to review your responses for accuracy and make any corrections as needed.*	*(If responses to the three items below sum to more than 1, a pop up box will appear that says, "The range of proportions that you responded to these three items sum to more than 1. Please review your responses for accuracy and revise any as needed.")*				
4.2j Transfer electronic imaging results (received in non-machine readable form, such as an e-fax) directly into system *Refers to saving or attaching an electronic submission, such as an e-fax, that is not electronically searchable into the EHR system. (An e-fax is a transmission of the image of a document directly from a computer or multi-purpose printer without the use of stand-alone fax equipment to generate the paper-based image.)*					
4.2k Enter imaging results manually into electronic system in a searchable field (whether received by fax, mail or phone) *Methods of entry include direct keyboard entry (typing); entering notes/data using templates, forms or drop-down menus; or dictation with the voice transcribed manually or via voice recognition into text that is later integrated into the electronic system and is searchable.*					
4.2l Receive electronically transmitted imaging results directly into system from facilities that have the capability to send such transmissions *Results are received electronically and do not need to be manually uploaded or posted into the system.*					
Referral and Consultation Requests					
4.2m Enter requests for referrals to or consultation with other providers (for example, specialists, sub-specialists, physical therapy, speech therapy, nutritionists) *Refers to recording physician or patient requests for referral/ consultation, scheduling the referral/ consultation, and tracking results of referral/ consultation.*					
Sharing Information with other Providers					
4.2n Transmit medication lists or other medical information to other providers (for example, hospitals, home health agencies, or other physicians)					

Functions	None	Some, but less than ¼	1/4 or more, but less than 1/2	1/2 or more, but less than ¾	3/4 or more
4.2o Transmit laboratory results to other providers (for example, hospitals, home health agencies, or other physicians) *Results are sent as machine-readable data.*					
4.2p Transmit imaging results to other providers (for example, hospitals, home health agencies, or other physicians) *Results are sent as machine-readable data.*					
4.2q Receive electronically transmitted reports directly into system, such as discharge summaries, from hospitals or other facilities that have the capability to send such transmissions					
Prescription Orders					
Items 4.2r -2s, and –2t form a hierarchy of sending prescriptions, ordered by degree of technological sophistication. Your responses to the three questions should represent the *experience of all patients in your practice at this location over the past month.* *If the range of proportions given for these three questions sum to more than 1, a pop up box will appear that asks you to review your responses for accuracy and make any corrections as needed.* *Note that these questions exclude Schedule II-V drugs*	*(If responses to the three items below sum to more than 1, a pop up box will appear that says, "The range of proportions that you responded to these three items sum to more than 1. Please review your responses for accuracy and revise any as needed.")*				
4.2r Print prescriptions (new prescriptions and refills) on a computer printer and fax to pharmacy or hand to patient					
4.2s Fax prescription orders (new prescriptions and refills) electronically from electronic system *The prescription is faxed without using any paper or a stand-alone fax machine.*					
4.2t Transmit prescription orders (new prescriptions and refills) electronically directly from system to pharmacies that have the capability to receive such transmissions *The prescription is sent and received without relying on a stand-alone fax machine at either the provider's office or the pharmacy.*					

Domain 3: Clinical Decision Support

This section asks about the extent to which your practice uses an EHR system, electronic patient registry, or electronic prescribing system for clinical decision support.

When responding please refer to patients seen **over the past month** by ALL providers in this practice location, or by other office staff acting on behalf of those providers.

By "all providers" we mean all the primary care physicians, specialty physicians, physician assistants, nurse practitioners, and nurse midwives in this practice location (including those who are participating in the demonstration, as well as those who are not eligible for or not participating in the demonstration) as enumerated in 2.12.

Please *complete all questions in the survey unless directed within it to skip a section. If you are not aware of how all the providers in the practice are using the functions asked about in this section, please consult with them prior to answering the questions.*

Please estimate the proportion of patients for which providers (or others acting on their behalf) at this practice location use the EHR, electronic patient registry, or electronic prescribing system to perform each of the following functions (as opposed to relying on paper charts).

	PROPORTION OF PATIENTS				
Functions	**None**	**Some, but less than ¼**	**1/4 or more, but less than 1/2**	**1/2 or more, but less than ¾**	**3/4 or more**
4.3a Enter information from clinical notes into documentation templates *Documentation templates are preset formats that determine what information will be displayed on each page and how it will be displayed. Templates usually allow information to be displayed as discrete data elements (that is, each element of data is stored in its own field or box.) For example, the clinical notes page can have separate boxes for entry of notes or data about a patient's height, weight, blood pressure, or other vital signs.* *Methods of entry include direct keyboard entry (typing); entering notes/data using templates, forms or drop-down menus; or dictation with the voice transcribed manually or via voice recognition into text that is later integrated into the system.*					
4.3b View graphs of patient height or weight data over time					
4.3c View graphs of patient vital signs data over time (such as blood pressure or heart rate)					
4.3d Flag incomplete or overdue test results					
4.3e Highlight out of range test levels *Refers to system comparing test results with guidelines or provider-determined goals for this patient*					
4.3f View graphs of laboratory or other test results over time for individual patients					

Functions	None	Some, but less than ¼	1/4 or more, but less than 1/2	1/2 or more, but less than ¾	3/4 or more
4.3g Prompt clinicians to order necessary tests, studies, or other services					
4.3h Review and act on reminders at the time of a patient encounter regarding interventions, screening, or follow-up office visits recommended by evidence-based practice guidelines *[This question will be asked for each CAD, HF, diabetes, and preventive diagnosis identified in question 3.13]*					
4.3i Reference information on medications being prescribed *Electronic system displays information about medications stored in its e-prescribing module/ subsystem or offers providers links to Internet websites with such information.*					
4.3j Reference guidelines and evidence-based recommendations when prescribing medication for a patient *Electronic system links to published diagnosis-specific guidelines or recommendations that includes appropriate medications for that diagnosis*					

Domain 3: Clinical Decision Support (Cont.)

The next section asks about the extent to which your practice uses an EHR system (or an electronic patient registry or electronic prescribing system) for clinical decision support.

When responding please refer to this practice location's experience **over the past year.**

If you are not aware of how all the providers in the practice are using the functions asked about in this section, please consult with them prior to answering the questions.

For each type of report, please note the extent to which this practice location used the EHR, electronic patient registry or electronic prescribing system (as opposed to reviewing paper charts) to generate reports.

Extent of Use During Last Year

Report types	Not used during last year	As needed basis or at least once	Regularly for full practice
4.3k Search for or generate a list of patients requiring a specific intervention (such as an immunization)			
4.3l Search for or generate a list of patients on a specific medication (or on a specific dose of medication)			
4.3m Search for or generate a list of patients who are due for a lab or other test in a specific time interval			

Report types	Not used during last year	As needed basis or at least once	Regularly for full practice
4.3n Search for or generate a list of patients who fit a set of criteria, such as age, diagnosis and clinical indicator value. *For example, age less than 76, diagnosed with diabetes, and has an HbA1c greater than 9 percent.*			

Domain 4: Use of the System to Increase Patient Engagement/Adherence

This section asks about the extent to which your practice uses an EHR system, electronic patient registry, or electronic prescribing system for increasing patient engagement and adherence to their care plans.

When responding please refer to patients seen **over the past month** by ALL providers in this practice location, or by other office staff acting on behalf of those providers.

By "all providers" we mean all the primary care physicians, specialty physicians, physician assistants, nurse practitioners, and nurse midwives in this practice location (including those who are participating in the demonstration, as well as those who are not eligible for or not participating in the demonstration) as enumerated in 2.12.

Please estimate the proportion of patients for which providers (or others acting on their behalf) at this practice location use the EHR, electronic patient registry, or electronic prescribing system to perform each of the following functions (as opposed to relying on paper charts).

	PROPORTION OF PATIENTS				
Functions	**None**	**Some, but less than ¼**	**1/4 or more, but less than 1/2**	**1/2 or more, but less than ¾**	**3/4 or more**
4.4a Manage telephone calls *Refers to bringing up a patient's record whenever the patient calls or is called by the office and noting reason for the call.*					
4.4b Exchange secure messages with patients					
4.4c. Allow patients to view their medical records online					
4.4d Allow patients to provide information online to update their records					
4.4e Allow patients to request appointments online					
4.4f Allow patients to request referrals online					
4.4g Produce hard copy or electronic reminders for patients about needed tests, studies, or other services (for example, immunizations) *[This question will be asked for each CAD, HF, diabetes, and preventive diagnosis identified in question 3.13]*					

Functions	None	Some, but less than ¼	1/4 or more, but less than 1/2	1/2 or more, but less than ¾	3/4 or more
4.4h Generate written or electronic educational information to help patients understand their condition or medication *[This question will be asked for each CAD, HF, diabetes, and preventive diagnosis identified in question 3.13]*					
4.4i Create written care plans (personalized to patient's condition or age/gender for preventive care) to help guide patients in self-management *[This question will be asked for each CAD, HF, diabetes, and preventive diagnosis identified in question 3.13]*					
4.4j Prompt provider to review patient self-management plan (or patient-specific preventive care plan) with the patient during a visit *[This question will be asked for each CAD, HF, diabetes, and preventive diagnosis identified in question 3.13]*					
4.4k Modify self-management plan (or patient specific preventive care plan) as needed following a patient visit *[This question will be asked for each CAD, HF, diabetes, and preventive diagnosis identified in question 3.13]*					
4.4l Identify generic or less expensive brand alternatives at the time of prescription entry *Electronic system includes formularies that identify generic or less expensive alternatives to selected medication or offers providers links to Internet websites with such information.*					
4.4m Reference drug formularies of the patient's health plans/ pharmacy benefit manager to recommend preferred drugs at time of prescribing *Preferred drugs refer to medicines that receive maximum coverage under the patient's health plan.*					

Domain 5: Medication Safety

The next section asks about the extent to which your practice uses an EHR system, electronic patient registry, or electronic prescribing system for a variety of functions related to medication safety.

When responding please refer to patients seen **over the past month** by ALL providers in this practice location, or by other office staff acting on behalf of those providers.

By "all providers" we mean all the primary care physicians, specialty physicians, physician assistants, nurse practitioners, and nurse midwives in this practice location (including those who are participating in the demonstration, as well as those who are not eligible for or not participating in the demonstration) as enumerated in 2.12.

Please estimate the proportion of patients for which providers (or others acting on their behalf) at this practice location use the EHR, electronic patient registry system, or electronic prescribing system to perform each of the following functions (as opposed to relying on paper charts).

	PROPORTION OF PATIENTS				
Functions	**None**	**Some, but less than ¼**	**1/4 or more, but less than 1/2**	**1/2 or more, but less than ¾**	**3/4 or more**
4.5a Maintain medication list for individual patients *Refers to using the electronic system to create, update, store and display a list of all medications (prescription and non-prescription) that the patient is taking.*					
4.5b Generate new prescriptions (that is, system prompts for common prescription details including medication type and name, strength, dosage, and quantity)					
4.5c Generate prescription refills (that is, system allows provider to reorder a prior prescription by revising original details associated with it, rather than requiring re-entry)					
4.5d Select individual medication for prescription (for example, from a drop-down list in the electronic system)					
4.5e Calculate appropriate dose and frequency, or suggest administration route based on patient parameters such as age, weight, or functional limitations					
4.5f Screen prescriptions for drug allergies against the patient's allergy information					
4.5g Screen new prescriptions for drug-drug interactions against the patient's list of current medications					
4.5h. Check for drug-laboratory interaction *Such as to alert provider that patient is due for a certain laboratory or other diagnostic study to monitor for therapeutic or adverse effects of the medication or to alert provider that*					

Functions	None	Some, but less than ¼	1/4 or more, but less than 1/2	1/2 or more, but less than ¾	3/4 or more
patient is at increased risk for adverse effects. *Electronic system may either store this information or link to Internet websites with such information.*					
4.5i Check for drug-disease interaction *Electronic system may either store this information or link to Internet websites with such information.*					

SECTION 5 - Data Attestation

WARNING: You will be unable to make changes to your responses once you have completed this section.

5.1 I have reviewed the data submitted in this survey and agree that it is a correct assessment of this practice. I understand and acknowledge that my survey responses are accurate to the best of my knowledge and may be subject to validation. (Practices that knowingly make false attestations could lose any incentive payments that were made based on false data).

☐ Agree ☐ Disagree

5.2 Name: _____

5.3 Title: _____

Signature: (this line is for hard copy questionnaire. Otherwise 5.2 serves as the e-signature)

____ _____

5.4 Comments? Please add any comments about the survey here.

Thank you for completing this survey.

E-prescribing activities:	None 0	About ¼ 1	About ½ 2	About ¾ 3	All or nearly all 4
a. - Identify generic or less expensive brand alternatives at the time of prescription entry					
b. - Reference the drug formularies of the patient's health plans/pharmacy benefit manager to recommend preferred drugs at time of prescribing					
c. - Offer guidelines and evidence-based recommendations when prescribing medication for a patient					
d. - Calculate appropriate dose and frequency based on patient parameters such as age and weight					
e. - Maintain a list of each patient's current medications					
f. - Screen prescriptions for drug allergies against the patient's allergy information					
g. - Screen new prescriptions for drug-drug interactions against the patient's list of current medications					
h. - Select individual medication for prescription					
i. - Print prescriptions on a computer printer					
j. - Transmit prescriptions directly to pharmacy via electronic fax (no paper printed)					
k. - Transmit prescriptions directly to pharmacy via electronic means (without relying on a fax machine at either clinician’s office or in the pharmacy)					
l. - Provide patient-friendly information about the medication to the patient					

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APPENDIX A2

OSS SCORING METHOD

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MEMORANDUM

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TO: Lorraine Johnson

FROM: Sue Felt-Lisk[1]

DATE: 6/10/2009[2]
EHRD–052

SUBJECT: Revised OSS Scoring Plan

Physician practices assigned to the treatment group of the Centers for Medicare & Medicaid Services' (CMS) Electronic Health Records Demonstration (EHRD) will receive payments for their use of EHR systems based on their responses to the Office Systems Survey (OSS). This memorandum describes the plan for scoring Office Systems Survey responses for the purposes of calculating those payments.

The next two sections provide background and explain the method used to develop the OSS scoring plan (which includes assigning individual questions to broader domains). Section C explains the method for determining whether practices pass the minimum requirement to qualify for an incentive. Section D explains how questions and domains are scored, and Section E describes how the OSS summary score is built from the domain scores. The scoring plan ends with a description of how payment is determined, in Section F. Appendix A provides details about scoring registry and e-prescribing functions for practices with stand-alone systems.

A. BACKGROUND

The EHRD, which is authorized under Section 402 Medicare Waiver Authority, is being implemented by CMS. It expands upon the Medicare Care Management Performance (MCMP) demonstration as well as building upon other CMS demonstrations. Specifically, the EHRD tests whether performance-based financial incentives increase physician practices' adoption and use of electronic health records (EHRs) and improve the quality of care practices deliver to chronically ill patients with fee-for-service Medicare coverage.

Under the demonstration, treatment group practices will have the opportunity to receive three types of payments. The first, called the *systems* payment, (up to $5,000 per physician to a maximum of $25,000 per practice) is based on use of an EHR. It is available in all five years of the demonstration. The systems payment will be based on the practice's use of a minimum set of

[1] Input and comments throughout the development of this plan from Lorenzo Moreno and Jennifer Schore, and our physician researcher colleagues Mai Pham, Anne O'Malley, and Arnold Chen are gratefully acknowledged. In addition, this plan reflects the decisions and guidance of both CMS and Assistant Secretary for Planning and Evaluation (ASPE) staff and CMS contractors per several telephone conferences during August through December 2008 and related emails.

[2] Section 2 was revised to clarify that question 4.1c (an informational item, not an EHR function) is excluded from scoring, on July 28, 2010.

functions in an EHR system certified by the Certification Commission for Healthcare Information Technology (CCHIT), as measured by responses to an annually administered **practice survey (called the Office Systems Survey or OSS). Additional payment will be provided** for use of more sophisticated EHR functions. Practices that have not adopted minimal use of the EHR system by the end of the first year will not receive payment, but may remain in the demonstration.

In year 2, practices have the opportunity to receive systems payments and a second type of payment (up to $3,000 per physician to a maximum of $15,000 per practice) for *reporting on specific clinical quality measures*. (Practices that have not adopted minimal use of their EHR system by the end of the second year will be removed from the demonstration.)

In years 3 to 5, practices will have the opportunity to receive systems payments and a third type of payment (up to $10,000 per physician to a maximum of $50,000 per practice), a quality payment, *for performance on specific clinical quality measures*. The financial payments will be in addition to the normal fee-for-service Medicare payment practices receive for services delivered. Physicians could receive up to $58,000 per provider, up to a maximum of $290,000 per practice over the five years of the demonstration.[3]

The EHR Demonstration summary issued by CMS (June 10, 2008) states that practices will receive up to $45 per beneficiary (for beneficiaries with chronic conditions assigned to the practice) based on their performance on the Office Systems Survey.[4] Of the $45, a practice will receive $13.50 for meeting the core minimum function use requirement; the overall score on the survey will be used to calculate the percentage of the remaining $31.50 per beneficiary that the practice will receive. So a practice with two or more physicians that met the minimum requirements, scores 60 percent on the survey and has 200 beneficiaries with chronic conditions assigned to it would receive 6,480 ([200 x $13.50] + [200 x $31.50 x 60 percent]).

B. METHOD

To develop options for scoring the OSS, we first explored whether existing scoring mechanisms might serve as models. We reviewed the scoring of the DOQ-IT version of the OSS that was used to gauge DOQ-IT program progress. We concluded that a more comprehensive scoring mechanism is required for calculating EHR demonstration payments, that is, one that takes into account use of all or nearly all the EHR functions queried on the OSS. We spoke with key NCQA staff regarding scoring for the Physician Practice Connections, but their objectives are very different from those of the EHR demonstration in that they aim to determine if a practice has desirable care management practices in place, regardless of whether they are electronic. For example, a practice can get a high score on the Physician Practice Connections instrument without having an EHR.

[3] John C. Wilkin, Kerry E. Moroz. Erika G. Yoshino, and Laurie E. Pekala. "Electronic Health Records Demonstration Waiver Cost Estimate." Columbia, MD: Actuarial Research Corporation, December 13, 2007.

[4] "Electronic Health Records (EHR) Demonstration: Demonstration Summary," CMS. Dated June 10, 2008.

The scoring plan described in this memo relies on the following principles:

- The plan should be kept as simple as possible. The plan should not vary the scoring method by demonstration year; rather it must remain constant.
- The plan should recognize that early in the demonstration some practices will be new to the use of EHRs, but that over the demonstration period, use of EHRs could increase substantially.
- An overall summary score should be built up from domain scores on a relatively small number of domains that are conceptually distinct and would be perceived as relevant and meaningful to providers and CMS.

An initial draft of this plan (dated August 15, 2008) was reviewed and discussed with CMS and CMS partner staff through four telephone conferences (held during August through December 2008). Decisions made during those discussions are reflected in the text that follows.

We considered using the MCMP OSS data to support factor analysis during the development of the plan, but decided against it. Factor analysis relies on linear regression methods to identify groups of questions in a survey whose responses tend to be highly correlated and, therefore, can be grouped into a single factor or domain. Factor analysis aims at identifying the most important domains in a dataset. The main reasons for deciding not to use factor analysis to set the domains include technical considerations, limitations on available data, and potentially greater difficulty to explain the rationale. From a technical perspective, factor analysis can result in any number of domains, and the domains may or may not be ones that CMS, physician practices, or other interested parties would view as logical, despite their statistical basis. We also considered limitations in available data. Specifically, the only data potentially available for factor analysis is based on an older version of the OSS used for the MCMP, therefore the questions added to the OSS for the EHRD would not correspond to the domains that could be identified from the older OSS. Finally, explaining that the domains are based on statistical analysis to audiences that are not familiar with factor analysis may not be as satisfying as reviewing domains that have intuitive face validity and are grounded in medical practice.

C. MINIMUM REQUIREMENT FOR SYSTEM PAYMENT

To receive a systems payment, practices must have implemented a CCHIT-certified EHR and be using it for the following minimum core functions: recording of patient visit notes, recording of diagnostic test orders and results, and recording of prescriptions. To pass the minimum requirement to qualify for any system incentive, **all** of the following question responses are required:

1. Certified EHR: yes to OSS question 3.5 [Is the EHR system certified by the Certification Commission for Healthcare Information Technology (CCHIT)?] as of the June 1, 2009 start date or later (question 3.5a)

2. Recording of visit notes: non-zero response (that is, a response other than "none") to question 4.1d [Clinical notes for individual patients]
3. Recording of diagnostic test orders: non-zero responses to 4.1i [Recording (or entering) laboratory orders into electronic system] **AND** 4.1l [Recording (or entering) imaging orders into electronic system]
4. Recording of diagnostic test results: non-zero response to *any* of 4.1j, 4.2g, 4.2h and 4.2i (pertaining to laboratory results) **AND** non-zero response to *any* of 4.1m, 4.2j, 4.2k, and 4.2l (the parallel questions pertaining to imaging results). For reference, the 4.1j, and 4.2g through 4.2i for laboratory are:

    - 4.1j: Receiving laboratory results by fax or mail and scanning paper versions into electronic systems
    - 4.2g: Transfer electronic laboratory results (received in non-machine readable form, such as an e-fax) directly into system
    - 4.2h: Enter laboratory results manually into electronic system in a searchable field (whether received by fax, mail or phone)
    - 4.2i: Receive electronically transmitted laboratory results directly into system from facilities that have the capability to send such transmissions

5. Recording of prescriptions: Non-zero response to 4.1p [Recording (or entering) prescription medications (new prescriptions and refills) into electronic system].

If a practice passes this minimum requirement, an overall OSS score is calculated to determine the size of the per-patient payment to the practice.

D. QUESTION AND DOMAIN SCORING

1. Question Scoring

Fifty-three EHR functions are scored through response to questions on the OSS. Most questions are scored on a 0 to 4 (5-point) scale. The response choices for most items translate directly into their score, with 0 less desirable, representing no use of a function, and 4 indicating the function is used for "3/4 or more" patients. One question (4.1b–proportion of paper charts pulled) requires scoring in reverse of the response choices, because a better score on this question is lower. For the items pertaining to report generation, we will recode the responses on a 3-point scale such that 0 [Not used during last year]=0, 1 [As-needed basis at least once]=2, and 2 [Regularly for full practice]=4.

Hierarchical Item Sets

The OSS contains five sets of hierarchical items that are each scored as a set. A hierarchical item set consists of several consecutive questions in the OSS that represent progressively more advanced ways of using the EHR, so that as a practice advances in its use, it will indicate less use of the less advanced process and more use of the more advanced process.

The questions associated with these sets pertain to ordering laboratory tests, ordering radiology tests, receiving laboratory results, receiving radiology results, and prescription ordering. We will score each set of questions (representing a single function) together such that the result is a score between 0 and 4 just as with the other items. However, additional steps are necessary to arrive at the score for the set.

1. We will weight the response to the most advanced method most heavily in the score; specifically the lowest-level question response will be multiplied by 1; the middle-level response will be multiplied by 2; and the most advanced level question response will be multiplied by 3.

2. The products of the responses times their weight (1,2, or 3) will be summed and divided by 12, then multiplied by 4. In mathematical terms this is written [((Q1X1)+(Q2X2)+(Q3X3))/12] X 4. Twelve is the appropriate denominator since we would want a practice that responded with the highest response (3/4 or more) to the most advanced function to receive the maximum points. The multiplication times 4 is in order to rescale the result to a 0 to 4 scale, similar to most of the other OSS items. However, because of the exact categorical response boundaries of the individual items, the result can exceed 4, therefore capping is sometimes necessary.

3. Apply caps as follows, based on the response to the highest-level question in the hierarchy: cap to 4.0 if the highest-level question equals 4; cap to 3.75 if the highest-level question equals 3, and cap to 3.5 if the highest-level question equals less than 3. This method of capping reserves the top score (4) for practices that use the most advanced level function for 75 percent or more of their patients.

An example of scoring a hierarchical set is shown in the table below.

Ordering Laboratory Tests (Hierarchical Items)	**Example Practice Response to proportion of patients for which function used**	**Response is Multiplied by a Weighting Factor**
Print and fax laboratory orders	2 [1/4 or more but less than 1/2]	2 X 1 = 1
Fax laboratory orders electronically from system	3 [1/2 or more but less than 3/4]	3 X 2 = 6
Transmit laboratory orders directly from system to facilities that have the capability to receive such transmissions	2 [1/4 or more but less than 1/2]]	2 X 3 = 6
Sum of Weighted Responses Divided by 12 and Multiplied by 4		13/12 = 1.08 X 4 = 4.3
Cap Applied Based on Response to Highest-level Item (Transmit laboratory orders directly…)		3.5

Condition-Specific Items

Seven items pertaining to care management are asked on a condition-specific basis for diabetes, CAD, CHF, and prevention. This is because practices tend to begin using these functions as part of their attempt to improve quality on specific conditions, rather than all at once. For each of these items, a total score will be developed across the conditions. The total will be divided by 16, which is the total possible points since each of the 4 condition-specific items represents 4 possible points. Then the total will be rescaled to a 0 to 4 point scale similar to the other items by multiplying the percentage of possible points achieved by 4. The table below provides an example.[5]

4.3h Review and act on reminders at the time of a patient encounter…	**Response**
Diabetes	4 [3/4 or more]
CAD	0 [None]
CHF	2 [1/4 or more, but less than 1/2]
Prevention	2 [1/4 or more, but less than 1/2]
Total Score:	8/16 = .50
Rescaled Score:	.50 x 4 = 2

[5] The other six condition-specific items in the OSS are (1) produce hard-copy or electronic reminders for patients about needed tests, studies, or other services; (2) generate written or electronic educational information to help patients understand their medical condition or medication; (3) record that instructions or educational information were given to patient; (4) create written care plans to help guide patients in self-management; (5) prompt provider to review patient self-management plan with the patient during a visit; and (6) modify self-management plan as needed following a patient visit.

2. Exclusions from Scoring

Items 3.5 and 3.5a (certified EHR as of June 1, 2009 or later) will not be included in the scoring. Nearly all functions queried on the OSS are scored, except the following that pertain to minimum requirements, and three additional items:

Minimum Requirement Items

4.1d (maintain clinical notes)

4.1i (record or enter laboratory orders)

4.1l (record or enter imaging orders)

4.1j (receive laboratory results by fax or mail and scan paper versions into electronic system)

4.1m (receive imaging results by fax or mail and scan paper versions into electronic system), and

4.1p (record or enter prescription medications (new prescriptions and refills) into electronic system)

Other Items

4.4e (allow patients to request appointments online)

4.4f (allow patients to request referrals online)

4.1c (method used to transition paper records to the EHR system)

The reason for excluding 4.4e and 4.4f is that they pertain to the interaction of the patient with the practice management system rather than the EHR system, and to date they have no known implications for quality improvement or savings. (Progress on these items will still be tracked in the evaluation.) Item 4.1c is not scored because it is informational in nature—it does not indicate use of an EHR function. As noted above, the minimum requirement for receiving laboratory results may be met by 4.1j (which is never scored), or by any of 4.2g, 4.2h, or 4.2i (which are always scored). Similarly, the minimum requirement for receiving imaging results may be met by either 4.1m (which is never scored), or by any of 4.2j, 4.2k, or 4.2l (which are always scored).

3. Recodes to 0 if Stand-Alone Registry or E-Prescribing System Is Not Linked to EHR

Condition-specific "registry" items are asked of practices that indicate that they have a stand-alone registry or who use their EHR to identify patients with specific diagnoses or medications; identify patients overdue for specific therapies; facilitate prompt ordering of

specific laboratory tests or recommended drugs; and facilitate prompt communication with patients requiring follow-up. Similarly, items about e-prescribing are asked of practices that indicated they have a stand-alone e-prescribing system or who e-prescribe through their EHR. However, when a practice has a stand-alone registry or stand-alone e-prescribing system, their responses to the related questions will only be counted in their OSS score if they also indicated the stand-alone systems they use are linked to their EHR. If the stand-alone systems are not linked, the practice's responses to the condition-specific function items or e-prescribing items will be recoded to 0 for purposes of scoring. This implements a CMS policy decision that these questions should only be counted if the stand-alone systems are linked in some way to the practice's EHR. Appendix A displays the threshold questions and the implications of various responses to them for asking and scoring the registry and e-prescribing items.

4. Domain Definitions and Scoring

Five domains were defined to represent the objectives of the functions queried in the OSS:

1. Completeness of Information
2. Communication About Care Outside the Practice
3. Clinical Decision Support
4. Increasing Patient Engagement/Adherence
5. Medication Safety

Each of these objectives is intuitively tied to care improvements. Some functions could contribute to more than one of the five objectives represented by the domains. However, in order to keep the scoring approach simple we included each question in only one domain representing its predominant objective. The predominant objective for each function was based on consensus among CMS and ASPE staff and CMS contractors. Use of a single predominant domain per question avoids complexity in understanding how any given function contributes to the score, and allows the questions in the OSS to be ordered by domain without repetition.

The steps to score each domain are (1) sum the points for each question within the domain, and (2) calculate the percentage of possible points achieved in each domain.

Note that the method for scoring each domain gives each function within the domain equal weight because all functions are scored on a 0 to 4 scale. The number of scored functions per domain ranges from 9 to 14.

E. OSS SUMMARY SCORE

The OSS summary score will be calculated by multiplying each domain score by its weight, and summing the products. Domain weights were decided by CMS through consensus among

involved CMS and ASPE staff, after considering input from MPR and ARC. The domain weighting scheme gives three domains slightly higher weights based upon CMS' understanding from a literature review conducted by ARC that at present, in general, evidence suggests the potential for savings from use of EHR functions related to electronic laboratory and radiology ordering, clinical decision support and medication safety checks (domains 2, 3 and 5).

Three additional points will be added to the summary score each year the practice uses a system with current CCHIT certification. This is hoped to encourage practices to upgrade their systems as certifications expire, while allowing practices that do not choose to make such an upgrade to remain in the demonstration. The total score is capped at 100.

The example below assumes item points within each domain have been assigned, hierarchical and condition-specific items have been recoded and rescaled as described above, stand-alone system items have been recoded where applicable, and the sum has been calculated for each domain.

A Domain	B Number of Items	C Sum of Item Points/Possible Points	D Domain Score (of a possible 100) (Column C x 100)	E Domain Weight	F Product (Column D X E)
1. Completeness of Information	9	34/36	94.4	.17	16.0
2. Communication About Care Outside the Practice	10	0/40	0.0	.22	0.0
3. Clinical Decision Support	14	53/56	94.6	.22	20.8
4. Increasing Patient Engagement/Adherence	11	20/44	45.5	.17	7.7
5. Medication Safety	9	15/36	41.7	.22	9.2
Total OSS Score (Rounded up to Nearest Integer)					54*
Add 3 Points for Current CCHIT Certification					57*

*Maximum score is 100.

F. DETERMINATION OF PAYMENT

CMS has decided to provide a minimum payment of $13.50 per beneficiary with chronic illness assigned to the practice for practices that meet the minimum criteria. (The maximum payment, as noted, is $45 per beneficiary.) This recognizes that the OSS contains an extensive

list of EHR functions related to care improvement, a list that not every EHR may be capable of at the start of the demonstration, and that is unlikely to be implemented by a practice all at once or quickly. Without attention to this in the scoring or payment methodologies, practices may be discouraged from enrolling in the demonstration, feeling they would not have a reasonable chance to get more than a very small portion of the systems payment in the first two years. CMS set the minimum at 30 percent of the $45 total available amount. The OSS score will be applied to determine how much of the remaining $31.50 the practices will receive. The examples below illustrate how payment is calculated.

	Practice #:			
	1	2	3	4
Minimum Criteria:	Met	Not Met	Met	Met
OSS Score:	25	50	75	100
CCHIT-Certification:				
Ever	Yes	Yes	Yes	Yes
Current	Yes	No	No	Yes
Adjusted OSS Score	28	na	na	100*
Minimum Payment	$13.50	$ 0.00	$13.50	$13.50
OSS Score-Based Payment	$8.82	na	$23.63	$31.50
Total Payment Per Beneficiary with Chronic Illness[6]	$22.32	$0.00	$37.13	$45.00

*Maximum score is 100.

cc: Jennifer Schore, Lorenzo Moreno, Rachel Shapiro

[6] Actual payment per beneficiary may be lower if the physician or practice runs up against the demonstration caps on total physician or practice revenue from the demonstration.

APPENDIX A: OSS ITEMS RECODED TO ZERO IF PRACTICE USES STAND-ALONE REGISTRY OR E-PRESCRIBING NOT LINKED TO AN EHR

Table A.1 Threshold Questions For Registry and E-Prescribing Items

Registry:	Practice Response:	Implication:
3.9a : Has your practice at this location implemented an EHR (rather than a stand-alone patient registry) to perform registry functions, such as tracking patients who have a specific chronic illness, or receive preventive care (that is, immunizations, mammography and other cancer screening) for at least one condition? (By "implemented" we mean an EHR has been purchased, installed, and tested, and is currently being used.)	Yes	The registry questions in Table A.2 are asked and scored
	No	Continue to item 3.9b
3.9b: Has your practice at this location implemented a stand-alone patient registry to track patients who have a specific chronic illness, or receive preventive care (that is, immunizations, mammography and other cancer screening) for at least one condition? (By "implemented" we mean a registry has been purchased, installed, and tested, and is currently being used.)	Yes	Continue to item 3.9c
	No	The registry questions in Table A.2 are not asked, and thus receive a "0" score
3.9c: Is this stand-alone patient registry linked with your EHR system? That is, do you electronically update the registry from the EHR system?	Yes	The registry questions in Table A.2 are asked and scored
	No	The registry questions in Table A.2 are asked, but the responses are recoded to "0" for purposes of payment
E-Prescribing		
3.15a: Has your practice at this location implemented an EHR to generate prescriptions? (By "implemented" we mean an EHR has been purchased, installed, and tested, and is currently being used.)	Yes	The e-prescribing questions in Table A.2 are asked and scored
	No	Continue to item 3.15b
3.15b: Has your practice at this location implemented a stand-alone electronic prescribing system to generate prescriptions? (By "implemented" we mean an electronic prescribing system has been purchased, installed, and tested, and is currently being used.)	Yes	Continue to item 3.15c
	No	The e-prescribing questions in Table A.2 are not asked, and thus receive a "0" score
3.15c: Is this stand-alone prescription system linked with your EHR system? That is, do you electronically update the prescription system from the EHR system?	Yes	The e-prescribing questions in Table A.2 are asked and scored
	No	The e-prescribing questions in Table A.2 are asked, but the responses are recoded to "0" for purposes of payment

Table A.2 Registry and E-Prescribing Items Whose Scoring May be Affected by the Threshold Questions Listed in Table A.1

Registry-Related Items

4.1o. Record that instructions or educational information were given to patient

4.3h. Review and act on reminders at the time of a patient encounter regarding interventions, screening, or follow-up office visits recommended by evidence-based practice guidelines

4.4g. Produce hard copy or electronic reminders for patients about needed tests, studies, or other services (for example, immunizations)

4.4h. Generate written or electronic educational information to help patients understand their condition or medication

4.4i. Create written care plans (personalized to patient's condition or age/gender for preventive care) to help guide patients in self-management

4.4j. Prompt provider to review patient self-management plan (or patient-specific preventive care plan) with the patient during a visit

4.4k. Modify self-management plan (or patient specific preventive care plan) as needed following a patient visit

E-Prescribing Items

4.1p. Recording (or entering) prescription medications (new prescriptions and refills) into electronic system **[Minimum requirement, no score for payment purposes—minimum requirement not met if e-prescribing system not linked to EHR]**

4.2r. Print prescriptions (new prescriptions and refills) on a computer printer and fax to pharmacy or hand to patient

4.2s. Fax prescription orders (new prescriptions and refills) electronically from electronic system

4.2t. Transmit prescription orders (new prescriptions and refills) electronically directly from system to pharmacies that have the capability to receive such transmissions

4.3i. Reference information on medications being prescribed

4.3j. Reference guidelines and evidence-based recommendations when prescribing medication for a patient

4.4l. Identify generic or less expensive brand alternatives at the time of prescription entry

4.4m. Reference drug formularies of the patient's health plans/ pharmacy benefit manager to recommend preferred drugs at time of prescribing

4.5b. Generate new prescriptions (that is, system prompts for common prescription details including medication type and name, strength, dosage, and quantity)

4.5c. Generate prescription refills (that is, system allows provider to reorder a prior prescription by revising original details associated with it, rather than requiring re-entry)

4.5d. Select individual medication for prescription (for example, from a drop-down list in the electronic system)

4.5e. Calculate appropriate dose and frequency, or suggest administration route based on patient parameters such as age, weight, or functional limitations

4.5f. Screen prescriptions for drug allergies against the patient's allergy information

4.5g. Screen new prescriptions for drug-drug interactions against the patient's list of current medications

4.5h. Check for drug-laboratory interaction

4.5i. Check for drug-disease interaction

APPENDIX A3

SURVEY RESULTS FOR EACH OSS FUNCTION MEASURED

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Table A.3 Practices' responses to function-specific questions, by domain (percentage of practices responding "yes" to each category)

Domain 1: Completeness of Information

PROPORTION OF PAPER RECORDS/CHARTS

Functions	None	Some, but less than 1/4	1/4 or more, but less than 1/2	1/2 or more, but less than 1/3	3/4 or more	Number of responses
4.1a. Paper records that have been transitioned to the EHR system. By "transitioned" we mean either scanned documents in full into the EHR or keyed in data items by hand (such as patient demographics, medical history, blood pressure readings, test results)	21	7	7	12	52	273
4.1b. Paper charts that were pulled for scheduled patient visits over the past month.	32	25	7	5	30	274

Functions	Scan Documents in Full	Key in data items by hand	Combination	Other	Number of Responses
4.1c. Predominant method used to transition paper records into EHR system	9	15	69	7	218

PROPORTION OF PATIENTS

Functions	None	Some, but less than 1/4	1/4 or more, but less than 1/2	1/2 or more, but less than 3/4	3/4 or more	Number of Responses
4.1d. Clinical notes for individual patients *Refers to using the electronic system to create, update, store and display clinical notes.*	18	6	1	4	71	275
4.1e. Allergy lists for individual patients *Refers to using the electronic system to create, update, store and display a list of medications or other agents (food, environmental) to which patient has a known allergy or adverse reaction.*	12	5	2	5	76	275
4.1f. Problem or diagnosis lists for individual patients *Refers to using the electronic system to create, update, store and display a list of problems or diagnoses for a patient.*	15	7	1	7	70	274
4.1g. Patient demographics (for example, age or sex) *Methods of entry include direct keyboard entry (typing); entering notes/data using templates, forms or drop-down menus; or dictation with the voice transcribed manually or via voice recognition into text that is later integrated into the system.*	11	4	1	1	83	275
4.1h. Patient medical histories	16	8	5	5	67	275
4.1i. Recording (or entering) laboratory orders into electronic system *Methods of entry include direct keyboard entry (typing); entering notes/data using templates, forms or drop-down menus; or dictation with the voice transcribed manually or via voice recognition into text that is later integrated into the system.* *Includes orders for lab tests conducted by external providers and the practice itself.*	21	7	1	5	66	275

Functions	None	Some, but less than 1/4	1/4 or more, but less than 1/2	1/2 or more, but less than 3/4	3/4 or more	Number of Responses
4.1j. Receiving laboratory results by fax or mail and scanning paper versions into electronic system *Refers to converting the image or text from paper into a digital image or text that is saved in the electronic system.* *Includes results from lab tests conducted by external providers and the practice itself.*	28	23	7	4	39	275
4.1k. Reviewing laboratory test results electronically *Refers to (1) system tracking that results have been received and (2) physician examining screens with displays of results stored in the system.*	24	7	4	9	55	274
4.1l. Recording (or entering) imaging orders into electronic system *Methods of entry include direct keyboard entry (typing); entering notes/data using templates, forms or drop-down menus; or dictation with the voice transcribed manually or via voice recognition into text that is later integrated into the system.* *Includes orders for imaging conducted by external providers and the practice itself.*	24	9	3	6	59	274
4.1m. Receiving imaging results by fax or mail and scanning paper versions into electronic system *Refers to converting the image or text from paper into a digital image or text that is saved in the electronic system.* *Includes results from imaging conducted by external providers and the practice itself.*	26	18	4	4	47	274
4.1n. Reviewing imaging results electronically *Refers to (1) system tracking that results have been received and (2) physician examining screens with displays of results stored in the system.*	40	8	4	5	43	275
4.1o1. Recording that instructions or educational information were given to diabetes patients	3	24	9	15	49	160
4.1o2. Recording that instructions or educational information were given to coronary artery disease patients	3	35	6	17	39	115
4.1o3. Recording that instructions or educational information were given to congestive heart failure patients	4	32	6	15	43	105
4.1o4. Recording that instructions or educational information were given to preventive care patients	1	29	8	10	51	150
4.1p Recording (or entering) prescription medications (new prescriptions and refills) into electronic system *Methods of entry include direct keyboard entry (typing); entering notes/data using templates, forms or drop-down menus; or dictation with the voice transcribed manually or via voice recognition into text that is later integrated into the system.*	5	3	5	5	82	275

Domain 2: Communication of Care Outside the Practice ***PROPORTION OF PATIENTS***

Functions	None	Some, but less than ¼	1/4 or more, but less than 1/2	1/2 or more, but less than ¾	3/4 or more	Number of Responses
Laboratory Orders						
4.2a Print and fax laboratory orders to facilities outside the practice *Order is first printed and then sent over a telephone line using a stand-alone fax machine.*	46	33	5	6	9	276
4.2b Fax laboratory orders electronically from system, or order electronically through a portal maintained by facilities outside the practice *Order is generated electronically, using a macro or template, and faxed directly through the electronic system to the laboratory or ordered directly without using any paper or a stand-alone fax machine.*	67	16	5	3	9	276
4.2c Transmit laboratory orders electronically directly from system to facilities outside the practice that have the capability to receive such transmissions *Order is sent as machine-readable data.*	68	5	5	4	18	276
Imaging Orders						
4.2d Print and fax imaging orders to facilities outside the practice *Order is first printed and then sent over a telephone line using a stand-alone fax machine.*	37	31	8	7	17	276
4.2e Fax imaging orders electronically from system, or order electronically through a portal maintained by facilities outside the practice *Order is generated electronically, using a macro or template, and faxed directly through the electronic system to the imaging facility without using any paper or a stand-alone fax machine.*	79	9	4	2	6	275
4.2f Transmit imaging orders electronically directly from system to facilities outside the practice that have the capability to receive such transmissions *Order is sent as machine-readable data.*	82	7	3	1	7	275
Laboratory Results						
4.2g Transfer electronic laboratory results (received in non-machine readable form, such as an e-fax) directly into system *Refers to saving or attaching an electronic submission, such as an e-fax, that is not electronically searchable in the EHR system. (An e-fax is a transmission of the image of a document directly from a computer or multi-purpose printer without the use of stand-alone fax equipment to generate the paper-based image.)*	72	16	4	3	5	276
4.2h Enter laboratory results manually into electronic system in a searchable field (whether received by fax, mail or phone) *Methods of entry include direct keyboard entry (typing); entering notes/data using templates, forms or drop-down menus; or dictation with the voice transcribed manually or via voice recognition into text that is later integrated into the electronic system and is searchable.*	49	37	6	3	5	274

Functions	None	Some, but less than ¼	1/4 or more, but less than 1/2	1/2 or more, but less than ¾	3/4 or more	Number of Responses
4.2i Receive electronically transmitted laboratory results directly into system from facilities that have the capability to send such transmissions *Results are received electronically and do not need to be manually uploaded or posted into the system.*	38	2	6	6	48	274
Imaging Results						
4.2j Transfer electronic imaging results (received in non-machine readable form, such as an e-fax) directly into system *Refers to saving or attaching an electronic submission, such as an e-fax, that is not electronically searchable into the EHR system. (An e-fax is a transmission of the image of a document directly from a computer or multi-purpose printer without the use of stand-alone fax equipment to generate the paper-based image.)*	78	8	3	3	9	276
4.2k Enter imaging results manually into electronic system in a searchable field (whether received by fax, mail or phone) *Methods of entry include direct keyboard entry (typing); entering notes/data using templates, forms or drop-down menus; or dictation with the voice transcribed manually or via voice recognition into text that is later integrated into the electronic system and is searchable.*	61	16	7	5	12	276
4.2l Receive electronically transmitted imaging results directly into system from facilities that have the capability to send such transmissions *Results are received electronically and do not need to be manually uploaded or posted into the system.*	62	3	6	4	25	276
Referral and Consultation Requests						
4.2m Enter requests for referrals to or consultation with other providers (for example, specialists, sub-specialists, physical therapy, speech therapy, nutritionists) *Refers to recording physician or patient requests for referral/ consultation, scheduling the referral/ consultation, and tracking results of referral/ consultation.*	38	14	5	10	33	276
Sharing Information with other Providers						
4.2n Transmit medication lists or other medical information to other providers (for example, hospitals, home health agencies, or other physicians)	43	14	7	4	32	275
4.2o Transmit laboratory results to other providers (for example, hospitals, home health agencies, or other physicians) *Results are sent as machine-readable data.*	55	15	6	5	19	276
4.2p Transmit imaging results to other providers (for example, hospitals, home health agencies, or other physicians) *Results are sent as machine-readable data.*	59	15	4	4	18	275
4.2q Receive electronically transmitted reports directly into system, such as discharge summaries, from hospitals or other facilities that have the capability to send such transmissions	62	6	4	4	24	276

Functions	None	Some, but less than ¼	1/4 or more, but less than 1/2	1/2 or more, but less than ¾	3/4 or more	Number of Responses
Prescription Orders						
4.2r Print prescriptions (new prescriptions and refills) on a computer printer and fax to pharmacy or hand to patient	17	63	11	4	5	276
4.2s Fax prescription orders (new prescriptions and refills) electronically from electronic system *The prescription is faxed without using any paper or a stand-alone fax machine.*	37	26	17	12	8	275
4.2t Transmit prescription orders (new prescriptions and refills) electronically directly from system to pharmacies that have the capability to receive such transmissions *The prescription is sent and received without relying on a stand-alone fax machine at either the provider's office or the pharmacy.*	18	11	12	17	42	276

Domain 3: Clinical Decision Support ***PROPORTION OF PATIENTS***

Functions	None	Some, but less than 1/4	1/4 or more, but less than 1/2	1/2 or more, but less than 3/4	3/4 or more	Number of Responses
4.3a Enter information from clinical notes into documentation templates *Documentation templates are preset formats that determine what information will be displayed on each page and how it will be displayed. Templates usually allow information to be displayed as discrete data elements (that is, each element of data is stored in its own field or box.) For example, the clinical notes page can have separate boxes for entry of notes or data about a patient's height, weight, blood pressure, or other vital signs. Methods of entry include direct keyboard entry (typing); entering notes/data using templates, forms or drop-down menus; or dictation with the voice transcribed manually or via voice recognition into text that is later integrated into the system.*	21	10	4	8	57	276
4.3b View graphs of patient height or weight data over time	30	15	7	3	45	275
4.3c View graphs of patient vital signs data over time (such as blood pressure or heart rate)	31	13	7	3	47	276
4.3d Flag incomplete or overdue test results	41	20	5	6	28	275
4.3e Highlight out of range test levels *Refers to system comparing test results with guidelines or provider-determined goals for this patient*	35	7	5	5	49	275
4.3f View graphs of laboratory or other test results over time for individual patients	47	13	7	2	31	276
4.3g Prompt clinicians to order necessary tests, studies, or other services	43	8	9	13	26	275
4.3h1 Review and act on reminders at the time of a patient encounter regarding interventions, screening, or follow-up office visits recommended by evidence-based practice guidelines for diabetes patients	7	14	6	21	52	160
4.3h2 Review and act on reminders at the time of a patient encounter regarding interventions, screening, or follow-up office visits recommended by evidence-based practice guidelines for coronary artery disease patients	8	25	12	18	37	115
4.3h3 Review and act on reminders at the time of a patient encounter regarding interventions, screening, or follow-up office visits recommended by evidence-based practice guidelines for congestive heart failure patients	9	25	12	18	36	106
4.3h4 Review and act on reminders at the time of a patient encounter regarding interventions, screening, or follow-up office visits recommended by evidence-based practice guidelines for preventive care patients	6	9	11	12	61	150
4.3i Reference information on medications being prescribed *Electronic system displays information about medications stored in its e-prescribing module/ subsystem or offers providers links to Internet websites with such information.*	23	19	7	7	44	275
4.3j Reference guidelines and evidence-based recommendations when prescribing medication for a patient *Electronic system links to published diagnosis-specific guidelines or recommendations that includes appropriate medications for that diagnosis*	35	22	11	5	28	276

EXTENT OF USE DURING LAST YEAR

Report types	Not used during last year	As needed basis or at least once	Regularly for full practice	Number of Responses
4.3k Search for or generate a list of patients requiring a specific intervention (such as an immunization)	57	34	9	276
4.3l Search for or generate a list of patients on a specific medication (or on a specific dose of medication)	51	42	7	276
4.3m Search for or generate a list of patients who are due for a lab or other test in a specific time interval	64	25	12	275
4.3n Search for or generate a list of patients who fit a set of criteria, such as age, diagnosis and clinical indicator value. *For example, age less than 76, diagnosed with diabetes, and has an HbA1c greater than 9 percent.*	57	30	13	276

Domain 4: Use of the System to Increase Patient Engagement/Adherence ***PROPORTION OF PATIENTS***

Functions	None	Some, but less than 1/4	1/4 or more, but less than 1/2	1/2 or more, but less than 3/4	3/4 or more	Number of Responses
4.4a Manage telephone calls *Refers to bringing up a patient's record whenever the patient calls or is called by the office and noting reason for the call.*	19	6	3	5	68	276
4.4b Exchange secure messages with patients	76	17	2	1	3	276
4.4c. Allow patients to view their medical records online	85	11	2	1	1	275
4.4d Allow patients to provide information online to update their records	87	10	1	1	0	276
4.4e Allow patients to request appointments online	83	13	2	0	1	276
4.4f Allow patients to request referrals online	86	11	1	0	1	276
4.4g1 Produce hard copy or electronic reminders for diabetes patients about needed tests, studies, or other services (for example, immunizations)	29	26	5	6	34	160
4.4g2 Produce hard copy or electronic reminders for coronary artery disease patients about needed tests, studies, or other services (for example, immunizations)	32	30	7	3	29	115
4.4g3 Produce hard copy or electronic reminders for congestive heart failure patients about needed tests, studies, or other services (for example, immunizations)	32	30	6	3	29	106
4.4g4 Produce hard copy or electronic reminders for preventive care patients about needed tests, studies, or other services (for example, immunizations)	28	26	7	3	35	150
4.4h1 Generate written or electronic educational information to help diabetes patients understand their condition or medication	27	23	12	11	28	160
4.4h2 Generate written or electronic educational information to help coronary artery disease patients understand their condition or medication	32	30	10	12	16	115
4.4h3 Generate written or electronic educational information to help congestive heart failure patients understand their condition or medication	31	30	9	12	17	106
4.4h4 Generate written or electronic educational information to help preventive care patients understand their condition or medication	29	25	13	9	23	150

Functions	None	Some, but less than 1/4	1/4 or more, but less than 1/2	1/2 or more, but less than 3/4	3/4 or more	Number of Responses
4.4i1 Create written care plans (personalized to patient's condition or age/gender for preventive care) to help guide diabetes patients in self-management	63	19	5	8	6	160
4.4i2 Create written care plans (personalized to patient's condition or age/gender for preventive care) to help guide coronary artery disease patients in self-management	70	17	6	4	3	115
4.4i3 Create written care plans (personalized to patient's condition or age/gender for preventive care) to help guide congestive heart failure patients in self-management	68	19	6	3	5	106
4.4i4 Create written care plans (personalized to patient's condition or age/gender for preventive care) to help guide preventive care patients in self-management	70	18	6	4	2	150
4.4j1 Prompt provider to review patient self-management plan (or patient-specific preventive care plan) with the diabetes patient during a visit	54	17	5	7	17	160
4.4j2 Prompt provider to review patient self-management plan (or patient-specific preventive care plan) with the coronary artery disease patient during a visit	58	19	4	5	13	115
4.4j3 Prompt provider to review patient self-management plan (or patient-specific preventive care plan) with the congestive heart failure patient during a visit	58	16	4	8	14	106
4.4j4 Prompt provider to review patient self-management plan (or patient-specific preventive care plan) with the preventive care patient during a visit	57	16	6	7	13	150
4.4k1 Modify self-management plan (or patient specific preventive care plan) as needed following a diabetes patient visit	56	16	6	7	16	160
4.4k2 Modify self-management plan (or patient specific preventive care plan) as needed following a coronary artery disease patient visit	65	10	7	7	10	115
4.4k3 Modify self-management plan (or patient specific preventive care plan) as needed following a congestive heart failure patient visit	64	9	6	8	12	106
4.4k4 Modify self-management plan (or patient specific preventive care plan) as needed following a preventive care patient visit	63	15	6	6	9	150
4.4l Identify generic or less expensive brand alternatives at the time of prescription entry *Electronic system includes formularies that identify generic or less expensive alternatives to selected medication or offers providers links to Internet websites with such information.*	24	7	6	9	53	274
4.4m Reference drug formularies of the patient's health plans/ pharmacy benefit manager to recommend preferred drugs at time of prescribing *Preferred drugs refer to medicines that receive maximum coverage under the patient's health plan.*	29	9	7	10	45	274

Domain 5: Medication Safety ***PROPORTION OF PATIENTS***

Functions	None	Some, but less than 1/4	1/4 or more, but less than 1/2	1/2 or more, but less than 3/4	3/4 or more	Number of Responses
4.5a Maintain medication list for individual patients *Refers to using the electronic system to create, update, store and display a list of all medications (prescription and non-prescription) that the patient is taking.*	6	5	3	4	82	276
4.5b Generate new prescriptions (that is, system prompts for common prescription details including medication type and name, strength, dosage, and quantity)	7	6	3	4	81	276
4.5c Generate prescription refills (that is, system allows provider to reorder a prior prescription by revising original details associated with it, rather than requiring re-entry)	5	6	4	5	80	276
4.5d Select individual medication for prescription (for example, from a drop-down list in the electronic system)	6	7	3	5	79	275
4.5e Calculate appropriate dose and frequency, or suggest administration route based on patient parameters such as age, weight, or functional limitations	47	8	5	2	38	276
4.5f Screen prescriptions for drug allergies against the patient's allergy information	10	5	3	4	79	276
4.5g Screen new prescriptions for drug-drug interactions against the patient's list of current medications	11	8	5	2	75	276
4.5h.Check for drug-laboratory interaction *Such as to alert provider that patient is due for a certain laboratory or other diagnostic study to monitor for therapeutic or adverse effects of the medication or to alert provider that patient is at increased risk for adverse effects. Electronic system may either store this information or link to Internet websites with such information.*	61	15	3	3	19	276
4.5i Check for drug-disease interaction *Electronic system may either store this information or link to Internet websites with such information.*	58	11	4	3	24	276

Source: Year 1 OSS.

Notes: N=277 practices. The sample for all function-specific questions includes all practices who completed and OSS and implemented some sort of an electronic tool (an EHR, an electronic patient registry, or an electronic prescribing system).

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APPENDIX A4

OSS SCORES OF PRACTICES ELIGIBLE FOR DEMONSTRATION PAYMENTS

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Table A4 OSS Scores of Practices Eligible for Demonstration Payments[a]

	All Four Sites	Louisiana	Maryland	Pennsylvania	South Dakota
Number of Practices [a]	198	37	68	72	21
Average Unweighted Domain Score					
1. Completeness of information	79.9	78.4	78.8	79.9	85.8
2. Communication about care outside the practice	51.8	54.6	46.6	54.3	55.2
3. Clinical decision support	52.9	46.1	55.9	51.1	61.5
4. Increasing patient engagement/ adherence	31.8	24.1	31.8	35.4	33.5
5. Medication safety	76.5	79.2	75.4	75.3	79.5
Average Weighted Domain Score					
1. Completeness of information	13.6	13.3	13.4	13.6	14.6
2. Communication about care outside the practice	11.4	12.0	10.3	11.9	12.2
3. Clinical decision support	11.6	10.1	12.3	11.2	13.5
4. Increasing patient engagement/adherence	5.4	4.1	5.4	6.0	5.7
5. Medication safety	16.8	17.4	16.6	16.6	17.5
Average Total OSS Score[b]	59.4	57.5	58.4	59.8	64.0
Average Additional Credit for Current Certification	2.5	2.2	2.6	2.5	2.7
Average Final OSS Score[c]	61.9	59.7	61.1	62.4	66.8

Source: Scoring as described in "Revised OSS Scoring Plan" (Appendix A2); data are from the OSS, Year 1.

[a] This table includes only practices that continued to participate in the demonstration and were scored because they completed an OSS, had an EHR, and met minimum criteria for scoring.
[b] The total OSS score is the sum of the **weighted** domain scores.
[c] The final OSS score includes an additional 3 percentage points added to each practice's total OSS score when their EHR is currently certified. 167 of the 198 practices received these additional points.

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APPENDIX B

COMPARISON OF EHR FUNCTIONS FOCUSED ON IN EHRD AND THE MEDICARE EHR INCENTIVE PROGRAM (established by HITECH Within the American Recovery and Reinvestment Act of 2009)

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Table B.1 EHR Functions Incentivized by EHRD (OSS Items) that are Roughly Comparable to Each Core and Menu Set Items from the Medicare and Medicaid EHR Incentive Programs

Medicare EHR Incentive Program Stage 1 Measure (core/menu)*	EHR Function Incentivized by EHRD
Use CPOE for medication orders directly entered by any licensed healthcare professional who can enter orders into the medical record per state, local and professional guidelines (core)	Generate new prescriptions Generate prescription refills
Implement drug-drug and drug-allergy interaction checks (core)	Screen new prescriptions for drug-drug interactions against the patient's list of current medications Screen new prescriptions for drug allergies against the patient's allergy information
Generate and transmit permissible prescriptions electronically (eRx) (core)	Most points given for: Transmit prescription orders electronically directly from system to pharmacies with capability to receive them Some points given for faxing prescription orders electronically Few but still some points given for printing prescriptions and faxing them to pharmacy and/or handing them to patient
Record demographics (core) • preferred language • gender • race • ethnicity • date of birth	Patient demographics
Maintain an up-to-date problem list of current and active diagnoses (core)	Problem or diagnosis lists for individual patients
Maintain active medication list (core)	Maintain medication list for individual patients Record/enter new prescriptions and refills
Maintain active medication allergy list (core)	Allergy lists for individual patients
Record and chart changes in vital signs (core): • Height • Weight • Blood pressure • Calculate and display BMI • Plot and display growth charts for children 2-20 years, including BMI	View graphs of vital signs data over time View graphs of height/weight data over time
Record smoking status for patients 13 years old or older (core)	
Implement one clinical decision support rule relevant to specialty or high clinical priority along with the ability to track compliance that rule (core)	[While there is no comparable requirement in EHRD, many of the clinical decision support and list-generating functions that are listed in Table B-2 below and often not specifically covered by EHR Incentive Program requirements are likely how most practices would implement a decision support rule]
Report ambulatory clinical quality measures to CMS or the States (core)	Requires reporting of 26 specific clinical quality measures to CMS starting in year 2

Medicare EHR Incentive Program Stage 1 Measure (core/menu)*	EHR Function Incentivized by EHRD
Provide patients with an electronic copy of their health information (including diagnostic test results, problem list, medication lists, medication allergies), upon request (core)	Allow patients to view their medical records online
Provide clinical summaries for patients for each office visit (core)	
Capability to exchange key clinical information (for example, problem list, medication list, medication allergies, diagnostic test results), among providers of care and patient authorized entities electronically (core)	Transmit medication lists or other medical information to other providers Transmit laboratory results to other providers Transmit imaging results to other providers Receive electronically transmitted reports directly into system
Protect electronic health information created or maintained by the certified EHR technology through the implementation of appropriate technical capabilities (core)	
Implement drug-formulary checks (menu)	Reference drug formularies to recommend preferred drugs
Incorporate clinical lab-test results into certified EHR technology as structured data (menu)	Most points: Receive electronically transmitted laboratory results directly into system from facilities that have the capability to send such transmissions Some points: Enter laboratory results manually into electronic system in a searchable field Fewest points: Transfer electronic laboratory results (received in non-machine-readable form, such as an efax) directly into system
Generate lists of patients by specific conditions to use for quality improvement, reduction of disparities, research or outreach (menu)	Search for or generate a list of patients: - requiring a specific intervention - on a specific medication - due for a lab or other test in a specific time interval - fit a set of criteria such as age, diagnosis, and clinical indicator value
Send reminders to patients per patient preference for preventive/follow up care (menu)	Produce hard copy or electronic reminders for patients about needed tests, studies, or other services
Provide patients with timely electronic access to their health information (including lab results, problem list, medication lists, medication allergies) within four business days of the information being available to the EP (menu)	Allow patients to view their medical records online
Use certified EHR technology to identify patient-specific education resources and provide those resources to the patient if appropriate (menu)	Generate written or electronic educational information to help patients understand their condition or medication
The EP, eligible hospital or CAH who receives a patient from another setting of care or provider of care or believes an encounter is relevant should perform medication reconciliation (menu)	

Medicare EHR Incentive Program Stage 1 Measure (core/menu)*	EHR Function Incentivized by EHRD
The EP, eligible hospital or CAH who transitions their patient to another setting of care or provider of care or refers their patient to another provider of care should provide summary of care record for each transition of care or referral (menu)	
Capability to submit electronic data to immunization registries or Immunization Information systems and actual submission in accordance with applicable law and practice (menu)	
Capability to submit electronic syndromic surveillance data to public health agencies and actual submission in accordance with applicable law and practice (menu)	

* CMS reports that minor revisions to the measures are being made.

Table B.2 Other EHR Functions Incentivized in EHRD (not listed in Table B.1)

Completeness of Information Domain
Paper records transitioned to the EHR system (key data entered or full record scanned)
Paper charts pulled for recent visits
Clinical notes for individual patients
Patient medical histories
Record that instructions/educational information were given to patients
Record/enter lab orders
Record/enter imaging orders
Review laboratory results electronically
Scan paper imaging results into electronic system
Review lab results electronically
Scan paper lab results into electronic system
Communication About Care Outside the Practices
Most points for laboratory ordering electronically directly from system
Some points for electronic faxing of laboratory orders
Fewest points for print/fax laboratory orders
Most points for ordering imaging electronically directly from system
Some points for electronic faxing of imaging orders
Fewest points for print/fax imaging orders
Most points for receiving electronic imaging results directly into system
Some points for entering electronic imaging results manually into electronic system
Fewest points for transferring electronic imaging results (received in non-machine-readable format) directly into system
Enter requests for referrals/consultations

Clinical Decision Support
Flag incomplete/overdue test results
Highlight out-of-range test levels
View graphs of lab/test results over time
Prompt clinicians to order tests/studies
Review and act on reminders at the time of the patient encounter
Reference information on medications
Reference guidelines when prescribing
Use of System to Increase Patient Engagement/Adherence
Manage telephone calls
Exchange secure messages with patients
Patients update information online
Create written care plan to help guide patients in self-management
Prompt provider to review patient self-management plan with patient during a visit
Modify self-management plan as needed following a patient visit
Identify generic or less expensive brand alternatives at time of prescription entry
Medication Safety
Select medication (from a drop-down list, for example)
Calculate appropriate dose/frequency

Source: Office Systems Survey (for EHRD) and, for the Medicare and Medicaid EHR Incentive Program, "Table 2, Stage 1, Meaningful Use Objectives and Associated Measures Sorted by Core and Menu Set," Federal Register, Vol. 75, No. 144 (July 28, 2010, pp. 44370-44375).

APPENDIX C

CHARACTERISTICS OF VISITED AND NON-VISITED TREATMENT AND CONTROL GROUP PRACTICES

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Table C.1 Characteristics of Visited and Non-Visited Treatment and Control Group Practices* (in percent)

Practice Characteristics	Visited Treatment Practices (n=16)	Other Treatment Practices (n=396)	Visited Control Practices (n=8)	Other Control Practices (n=405)
Practice Size				
1-2	38	52	38	53
3-5	44	30	50	28
6-10	19	12	13	13
>10	0	7	0	6
Percent in a Medically Underserved Area	25	29	13	30
Percent in a Rural Area	19	17	13	15
Size of Medicare Fee-for-Service Population				
1-199	0	16	0	17
200-999	47	41	0	48
1,000 or more	47	35	100	27
No quantitative response	7	9	0	8
Percent Affiliated with or owned by a larger organization	27	44	NA	NA
Participates in at Least One other Quality Improvement, EHR, or Pay-for-Performance Program	60	62	NA	NA

Sources: Practice size and Medicare fee-for-service population from application data; Medically Underserved Area identified by Mathematica using HRSA data; Rural location from Area Resource File; affiliation and participation in quality improvement efforts from Office Systems Survey.

* The few with missing data for a characteristic were excluded from the calculations for that characteristic.

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APPENDIX D:

LIST OF COMMUNITY PARTNERS

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LIST OF COMMUNITY PARTNERS

The source of this information is the sites' applications to CMS to participate in the demonstration.

A. LOUISIANA

Louisiana Health Care Quality Forum – a statewide collaborative of public and private community stakeholders that includes the following organizations proposed to work to help recruit practices to the demonstration:

- Blue Cross Blue Shield Louisiana
- Louisiana Health Care Review (the state's QIO)
- Louisiana Academy of Family Physicians
- Louisiana State Medical Society
- Louisiana Public Health Institute
- Louisiana Medical Group Management Association

B. MARYLAND/DC

The Maryland/DC EHR Collaborative, which is comprised of:

- MedChi, the State Medical Society for Maryland
- Maryland Health Care Commission
- DC Medical Society

C. SOUTHWEST PENNSYLVANIA

Pittsburgh Regional Health Initiative, with support from:

- Highmark BCBS
- Aetna
- UPMC
- Allegheny Medical Society
- Hospital Council of Western PA
- VHA of Western Pennsylvania
- Vale-U-Health

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South Dakota eHealth Collaborative, located within the South Dakota Department of Health, with support from:

- South Dakota Department of Health
- South Dakota State Medical Association
- South Dakota Academy of Family Physicians
- South Dakota Foundation for Medical Care
- South Dakota Association of Health Care Organizations
- Avera Health
- Community Healthcare Association of the Dakotas, Inc.
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