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Survey Planning to Support Successful e-HIT Adoption in New Jersey

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Executive Summary

As New Jersey moves toward implementing interoperable health information technology (e-HIT), there is a need for timely, reliable, and representative information about the capabilities of e-HIT systems used by medical providers; the acquisition, installation, and use of these systems; and barriers and incentives which affect decisions to adopt e-HIT. This can best be achieved through the structured collection of data using survey instruments with consistent content and methodology, which will enable policymakers to assess progress toward successful e-HIT adoption across New Jersey. This report presents findings of a project to gather background information from key informants about the factors influencing e-HIT adoption, including barriers and incentives; to review existing survey content and methodology; and to develop proposed survey content. The Rutgers Center for State Health Policy (CSHP) gathered information through key informant interviews and focus groups representing hospitals, clinics, and medical practices. Project staff also examined a selection of survey instruments used by the federal government, states, professional organizations, and university researchers, as well as literature reviewing and critiquing these surveys.

Hospitals and Federally Qualified Health Centers (FQHCs) throughout New Jersey are at different stages of e-HIT adoption, although some have made substantial progress in implementing electronic health records (EHRs) and exchanging data with partners. The limited survey information available suggested low rates of EHR adoption by New Jersey physician practices, particularly for those practices serving higher percentages of Medicaid/NJ FamilyCare patients. However, our respondents reported enthusiasm about the potential benefits of EHR adoption for improving patient care.

Similar barriers to e-HIT adoption were mentioned by all medical providers:

- The high initial cost of purchasing EHR systems.
- Uncertainty about financing future maintenance costs.
- Confusion about definitions of 'meaningful use' and the implementation of Medicare and Medicaid incentives.
- Lack of clarity regarding laws and regulations governing privacy and security of patient health information and liability for security breaches.

Survey instruments which have been used to assess e-HIT adoption use inconsistent definitions of EHRs and items measuring system functionality. CSHP used the recommendations of a report initiated by the Office of the National Coordinator for Health Information Technology (Blumenthal et al, 2006) to identify core items to assess EHR adoption uniformly across hospitals, clinics, and ambulatory care practices (see Appendix).

Based on feedback from medical providers and our review of survey literature, the project team offers several conclusions:

- Many New Jersey hospitals have substantial experience and expertise in installing and maintaining EHRs, both among IT and medical staff. Hospitals have collaborated with community partners, such as ambulatory care physicians and FQHCs, to design shared records and implement interoperability. This expertise represents a resource for technical assistance as the state moves forward with e-HIT.
- Collaboration between health care providers at the community level on projects to improve quality of care (e.g., emergency room diversion, coordinating care for chronic conditions such as diabetes) illustrate the benefits of interoperability and generate enthusiasm among local providers. If the successes and lessons learned from these projects can be shared, they have the potential to increase willingness of other providers to adopt e-HIT.
- Continued training and education about privacy and security regulations, along with the removal of legal barriers, will substantially assist efforts to increase adoption of EHRs and realize the benefits of interoperability.
- While all providers in New Jersey serve vulnerable patients, physicians in smaller practices often serve a high proportion of Medicaid/NJ FamilyCare patients. It is not clear that the projected Medicare and Medicaid incentives will be sufficient to enable these physicians to adopt EHRs and exchange all necessary information with other providers. The needs of these physicians should be considered to assure that improvements in health care quality and efficiency are achieved in all parts of New Jersey. This is particularly important since national Health IT Policy Council Recommendations for Defining Meaningful Use include a health outcome and policy priority to reduce health disparities (Health IT Policy Committee, August 2009).
- Given the number of physicians who have limited experience with capable EHRs, it is likely that substantial technical assistance will be necessary to assist physicians with adoption and effective use of e-HIT. The experience of the FQHCs illustrates how a substantial amount of tailored technical assistance can assist providers with planning and decisions about e-HIT adoption.
- Timely, precise information will be necessary to assess the successful progress of e-HIT adoption. Getting reliable and complete information on a statewide basis will require careful survey and sampling design and vigorous follow-up to ensure that representative

data are gathered from providers who are active in e-HIT adoption as well as those who have not yet acquired systems. Survey instruments developed using recommendations from the report by Blumenthal and colleagues provide good content on EHR capabilities, incentives and barriers to adoption, and organizational characteristics. Moving forward, more work is required to test measures of interoperability and meaningful use of health records.

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Introduction

The Institute of Medicine and other experts have suggested that the wide-scale adoption and use of electronic health records (EHRs) has the potential to improve the quality and safety of health care, as well as reduce the costs of providing ambulatory care (Institute of Medicine, 2001; Bates et al, 2003; Hillestad et al, 2005). The New Jersey Department of Banking and Insurance (NJDOBI) has sponsored a variety of projects designed to move the state toward implementing interoperable health information technology (e-HIT) to facilitate the delivery of higher quality and more efficient health care. The State Coordinator, Office for e-HIT Development, has facilitated cooperation and the exchange of information between various state stakeholders, including the Governor's office, key legislators, professional associations, state agencies, payers, providers and the general public.

Hospitals, pharmacies, clinics, and medical practices in New Jersey are currently using a variety of e-HIT tools to generate clinical and payment information. As New Jersey develops a statewide plan to implement widespread adoption of interoperable health information technology, it is important to gather objective information about the acquisition, installation, and use of electronic health information systems. A multitude of survey instruments exist and have been used nationally and in other states to gather information from health care providers, including hospitals, ambulatory care physicians, practice/office managers, community clinics and other health care providers. These surveys use an assortment of definitions for EHRs, electronic medical records (EMRs), system capabilities, and e-HIT adoption. However, moving forward, New Jersey requires timely, reliable, and representative information about the capabilities of e-HIT systems used by medical providers; the acquisition, installation, and use of these systems; barriers and incentives which affect decisions to adopt e-HIT; and practice/organization characteristics. This can best be achieved through the structured collection of data using survey instruments with consistent content and methodology, which will enable policymakers to assess progress toward successful e-HIT adoption across New Jersey. DOBI contracted with the Rutgers Center for State Health Policy (CSHP) to gather background information from key informants about the factors influencing e-HIT adoption,

including barriers and incentives; to review existing survey content and methodology; to identify survey objectives and target populations; and to design proposed survey instruments.

The project period began June 1, 2009 and is scheduled to conclude December 31, 2009. This report details project activities and findings through September 2009.

Methods

CSHP gathered information from key informants through individual telephone/personal interviews and focus groups. Our informants included Chief Information Officers (CIOs) representing 26 acute care hospitals ranging in size, ownership structure, and location in New Jersey; approximately twenty physicians, including primary care and specialists, from university medical centers, community clinics, and individual practices; a practice manager; and a representative of the New Jersey Primary Care Association. CSHP received assistance from the New Jersey Hospital Association in selecting a range of hospital informants. Physicians were selected through a snowball sampling approach, utilizing a combination of CSHP contacts, recommendations from state agencies, and physicians recommended by other informants.

Project staff also examined a selection of survey instruments used by the federal government, states, professional associations, and university researchers. We reviewed literature reporting the results of these surveys and reviewed critiques of survey content and methodology.

Findings

Hospitals

Hospitals in New Jersey are at different stages of e-HIT adoption. Electronic exchange of payment information and connection with state registry databases is advanced, but hospitals differ in their degree of implementation and use of EHRs. Some hospitals have made impressive progress in adopting EHRs throughout multiple units and are progressing with plans to exchange information with other hospitals, ambulatory care providers, and emergency services, while other hospitals are earlier in the process of selecting and implementing systems.

Hospitals are collaborating with Federally Qualified Health Centers (FQHCs) in two communities to divert patients who customarily use emergency rooms for routine care to a more appropriate site where their care can be better managed. Collaborations are also occurring between hospitals and ambulatory care physicians to better manage patients with chronic conditions, such as diabetes, to improve health outcomes and make care more efficient. Several hospitals are providing expertise to make systems interoperable and to design

patient records which provide information to enable good clinical decisions and care management.

Hospital CIOs told us that getting EHR systems operational within hospitals has taken longer than they initially expected and has slowed activities to achieve interoperability with other healthcare providers.

Hospitals CIOs cited the following issues which impact introducing EMRs and making them clinically useful:

- Vendor systems have many capabilities, but many require extensive tailoring to effectively provide the specific information needed by clinicians at the point of treatment. Specific needs differ between units. Doctors confirmed that they have often worked extensively with MIS staff to make sure that information needed to make clinical decisions is available on a computer screen in a manner which permits the physician to absorb it in the limited time available (e.g., vital signs and lab results over the previous 24 hours). One hospital mentioned that it had taken over two years to perfect their EHR, but that it met physician needs well after tailoring.
- Introducing and debugging systems can be a major undertaking, requiring cooperation between the medical and MIS staff. It is important that this occurs with minimal disruption of medical operations on the unit, which is very challenging. If patient flow is disrupted, the hospital may lose money and quality of care can be compromised.
- Continuing costs of in-house support to tailor and maintain an EHR system can be as much as 20% of up-front purchase costs. These costs can be difficult to justify to hospital management, who in some cases are struggling to keep the hospital financially viable.
- The more a system is tailored by in-hospital MIS staff, the less a vendor is able to assist with maintenance.
- Features which are specific to one unit may create difficulties in sharing information with other units. CIOs reported that they have learned many lessons about successfully tailoring systems to minimize these difficulties.
- The successful use of an EHR on a unit requires process review, training, and education.
- Confusion about how *meaningful use* will be defined and how Medicare and Medicaid incentives will operate have slowed planning and implementation.

All hospitals include physicians in the process of evaluating and tailoring systems, and many physicians see a great deal of value in EHRs and are willing to collaborate to make them usable and effective. Physicians have strong opinions about what they need in an EHR, and some have been very skeptical about the value or usability of an EHR. However, those who have used a system which works for them have been very strong champions who have influence with their peers.

Several physicians who use EHRs in a hospital said that they have experience with systems which meet their needs well. However, different hospitals use different systems, which can be confusing for physicians. Oncologists appear to have the most difficulty finding systems which effectively provide all the information they need.

Hospital CIOs reported that both hospital management and physicians have expressed questions and concerns about implementation of the privacy and security rules which govern their ability to share data with other providers. While there is an understanding that electronic records can be more secure than paper records and can be better protected from unauthorized access, the application of rules to specific requests for access can still be confusing to medical staff. The State has provided education and assistance in understanding requirements, but there is still uncertainty in specific situations about the complex requirements under state and federal legislation. Systems can provide secure access to authorized users, but decisions must be made about which users should be authorized to view specific information, particularly when sharing protected health information with outside of the organization. More guidance and education from the State would be useful to help hospitals make appropriate decisions about privacy and security and educate all levels of their staff.

Financial considerations also impact the decisions of hospitals to adopt EHRs and interoperable technology. While hospitals will achieve improvements in patient safety and quality of care through implementing e-HIT, the financial benefits are less clear. While effective e-HIT technology can provide a competitive advantage for a hospital, the potential savings may be less apparent to hospital management. There are still questions about how much hospitals will benefit from cost savings in the future, versus whether payers and other parts of the medical system will see financial benefits from more efficient care.

A final issue raised by hospitals was whether the evolution of e-HIT technology throughout the state will benefit more prosperous hospitals to a greater extent than those with fewer resources. Hospitals in safety net areas of the state have fewer resources overall, and the costs of buying and maintaining systems are a particular challenge for them. CIOs from these hospitals reported that their management groups have great interest in the benefits of EHRs and interoperable systems, but resources are a major concern, particularly for those hospitals that are struggling to remain financially viable. They expressed concern that hospitals which are more prosperous have been able to make larger investments in developing EHRs and interoperability, and questioned whether these hospitals would be in a stronger position to get state and federal funding than hospitals that have not been able to advance as rapidly.

Physicians

In 2002, CSHP fielded the New Jersey State Physician Census for NJDOBI. The survey included several questions about use of email and computers. Table 1 below provides information about the answers to two questions, “Do you use computer systems (e.g., handheld or bedside PC) to

record prescriptions" and "Do you use computer systems (e.g., handheld or bedside PC) to record other medical information?" Overall, New Jersey physicians reported low use of computer systems. However, the percentage who reported use was higher for all patient-care physicians than for those who had more than 5% of their practice comprised of Medicaid/NJ FamilyCare patients. CSHP reported that physicians serving higher proportions of Medicaid and NJ FamilyCare patients tended to be younger, female, non-Hispanic black, or foreign-born. Primary care physicians, psychiatrists, and physicians practicing in health centers, hospital ambulatory settings, or other institutional practice setting served a significantly higher average percentage of Medicaid/NJ FamilyCare patients than other physicians (CSHP, March 2006).

Table 1. Use of Computers by Patient Care Physicians, NJ State Physician Census, 2002

Survey Item	All Patient-Care Physicians	Physicians with over 5% Medicaid/NJFC Patients
Use computer to record prescriptions	6.8%	4.3%
Use computer to record other medical information	16.2%	9.3%

The physicians we talked with confirmed that purchasing and maintaining ambulatory care EHRs with all the necessary capabilities can be tremendously expensive. Needs are very different between primary care and specialty physicians. Several doctors reported that they adopted EHRs early and need to update or replace their systems. For some, replacing a system is not only expensive, but leads to lower productivity while installing and learning a new system. In a few cases, patient data stored in the old system cannot be directly migrated to the new system and will need to be kept in paper form.

Physicians in smaller practices were concerned about their ability to evaluate and purchase systems on their own. They hoped to be able to benefit from the Medicare and Medicaid incentives, but felt that the up-front purchase costs were a barrier, particularly if their reimbursement rates for services were low. In addition, some physicians expressed a great deal of uncertainty about estimating costs to maintain a system. Other concerns were the burden on their administrative staff of installing and learning a system, maintaining proper security of patient data, and questions about their potential liability if a computer system is breached.

Several physicians mentioned that inner-city practices are often solo and resource-poor. Some concern was expressed about the willingness and ability of these providers to adopt EHRs; however, many of them serve patients who could benefit greatly from better coordination of care.

Federally Qualified Health Centers (FQHCs)

The NJ Primary Care Association (NJPCA) reported that FQHCs throughout New Jersey are at different stages of purchasing, installing, and using EHRs. Funding from private foundations and the Health Resources and Services Administration (HRSA) has enabled FQHCs to do planning and purchase EHRs. Those FQHCs which previously had not been able to purchase EHRs are now acquiring systems with federal funding, and the PCA has provided substantial guidance and support.

HRSA established detailed requirements for EHRs used by FQHCs, and the NJPCA has developed a list of vendors which meet these requirements. FQHCs are encouraged to group their purchases to obtain the best financial arrangements. The vendors chosen are expected to be able to provide systems which meet requirements and require very little tailoring. Most FQHCs have very little IT support, so their ability to modify or maintain systems is limited. There has been substantial advance training of FQHC executives, physicians, and other staff by the PCA, and training materials on CDs are available. In some centers, nurses with expertise in informatics have been working on information flow and protocols to facilitate installation and use of EHRs.

Getting all clinical components of EHR systems installed and operational in FQHCs has been challenging. The biggest problem has been integrating dental information. The guidance and training provided has been focused on providing information to assist FQHCs purchase and implement EHRs. There is still some concern about how ongoing maintenance costs will be covered.

The NJPCA can provide a central location for sharing FQHC data. As reported by the hospitals, some FQHCs are working on data exchange with hospitals in an effort to divert emergency room patients without emergent conditions into more appropriate care. Linking records is a challenge, and the project in Newark has had some difficulties with incorrect patient names and addresses. However, some patients move frequently, making it more difficult to match data. Despite this, these collaborations are moving ahead.

The Role of the State in Supporting e-HIT

We asked our informants for their opinions about how the State can use recovery grant money to support e-HIT adoption within New Jersey. We received a variety of responses; some of these suggestions have already been acted upon as this report is produced.

- Provide a Record Locator Service/Master Patient Index.
- Define standard elements which should be the foundation of any EHR.
- Assistance in removing privacy barriers which are a result of current legislation.
- Provide additional education about privacy and security regulations. Many respondents were aware of education that has been provided by state agencies, such

as training from the Office of e-HIT Development through the Medical Society. However, many respondents commented that a lot of education is still needed, so that medical providers will be prepared to share data under appropriate conditions.

- Provide tools such as standard consent forms.
- Improve state systems to facilitate increased interoperability.
- Support hospital and physician adoption of EHRs, as well as interoperability between partners. While several respondents suggested that it was most appropriate to focus on helping providers adopt EHRs before working on interoperability, others felt that Medicare and Medicaid incentives would help providers to adopt EHRs and suggested that state activities focus on interconnectivity.
- Some physicians and hospital informants suggested that the state consider funding to help equalize resources between wealthier and less wealthy providers. There was varied opinion about how effective Medicare and Medicaid incentives alone would be in stimulating increasing use of EHRs by physicians who do not already have systems.

Developing Survey Instruments to Measure e-HIT Adoption

The development and implementation of a successful policy for e-HIT adoption in New Jersey requires data to track variations in adoption by provider type and geography, as well as illustrations of successful implementation and use. This information can help policymakers identify gaps and predictors of adoption. CSHP reviewed a wide range of survey instruments which have been used to collect information about the use of electronic health technology from hospitals, physicians, management information systems managers, practice/office managers, and other health care providers. A substantial number of publicly-available survey instruments can be found at the website of the Agency for Health Research and Quality (AHRQ) in the Survey Compendium section of the Knowledge Library: http://healthit.ahrq.gov/portal/server.pt?open=512&objID=653&&PageID=12713&mode=2&in_hi_userid=3882&cached=true.

Our staff also reviewed instruments which have been used to collect national data, such as the National Ambulatory Medical Care Survey (NAMCS): Electronic Medical Records Supplement and the American Hospital Association Annual Survey: Information Technology Supplement. Survey instruments collectively use different definitions for electronic medical or health records and ask very different questions about the functionality of electronic systems, purchase and implementation, plans for enhancement, and factors which influence decisions to adopt technology. There are also numerous approaches to asking physicians about their degree of use of electronic systems and their attitudes toward use.

We also reviewed a report prepared by the Robert Wood Johnson Foundation, the Massachusetts General Hospital Institute for Health Policy, and the George Washington University School of Public Health and Health Services (Blumenthal et al, 2006). This report resulted from a project, initiated by the Office of the National Coordinator for Health Information Technology (ONC), to design a standardized approach to measure and interpret the adoption of information technology within the health care system nationally. Among the objectives of the project were development of common terms and a definition of what constitutes an EHR, as well as recommendations for the design and implementation of a standardized approach to data collection. The project was informed by the work of an Expert Consensus Panel and technical working subgroups, composed of national experts in subjects such as survey design, statistics, EHR development and use, economics, physician and hospital behavior, health care disparities and health care quality.

The project team determined that five content areas were required to adequately measure EHR adoption:

- whether the organization has an EHR,
- the nature of EHR capabilities,
- measures of incentives for adoption,
- measures of barriers to adoption, and
- ability to identify disparities in adoption among different vulnerable populations.

Four factors driving EHR adoption were considered particularly important to include in surveys:

- financial incentives and barriers,
- laws and regulations,
- the state of the technology, and
- organizational influences.

Two limitations noted in current survey content were items providing detailed information about interoperability and consumer perceptions.

Good methodology requires accurate representation of provider and patient populations, adequate sample size, a high proportion of those surveyed returning questionnaires (response rate), and careful survey development.

The report suggests approaches for interviewing physicians and hospitals, with two-stage sampling for large physician practices and hospitals. Subsequently, two national survey instruments have been developed based on the report recommendations, and study results have been published in the *New England Journal of Medicine* (DesRoches et al, 2008; Jha et al, 2009). The content of these surveys provides core items to measure EHR acquisition, installation, and use in patient-provider encounters. CSHP developed a draft survey for the New Jersey Division of Medical Assistance and Health Services, using these core items, along with additional items specific to Medicaid incentives (see Appendix). The New York Health

Information Technology Evaluation Collaborative is also using versions of these instruments to survey hospitals and physicians.

Conclusions

Based on project work to date, the project team offers several conclusions:

- Many New Jersey hospitals have substantial experience and expertise in installing and maintaining EHRs, both among IT and medical staff. Hospitals have collaborated with community partners, such as ambulatory care physicians and FQHCs, to design shared records and implement interoperability. This expertise represents a resource for technical assistance as the state moves forward with e-HIT.
- Collaboration between health care providers at the community level on projects to improve quality of care (e.g., emergency room diversion, coordinating care for chronic conditions such as diabetes) illustrate the benefits of interoperability and generate enthusiasm among local providers. If the successes and lessons learned from these projects can be shared, they have the potential to increase willingness of other providers to adopt e-HIT.
- Continued training and education about privacy and security regulations, along with the removal of legal barriers, will substantially assist efforts to increase adoption of EHRs and realize the benefits of interoperability.
- While all providers in New Jersey serve vulnerable patients, physicians in smaller practices often serve a high proportion of Medicaid/NJ FamilyCare patients. It is not clear that the projected Medicare and Medicaid incentives will be sufficient to enable these physicians to adopt EHRs and exchange all necessary information with other providers. The needs of these physicians should be considered to assure that improvements in health care quality and efficiency are achieved in all parts of New Jersey. This is particularly important, since national Health IT Policy Council Recommendations for Defining Meaningful Use include a health outcome and policy priority to reduce health disparities (Health IT Policy Committee, August 2009).
- Given the number of physicians who have limited experience with capable EHRs, it is likely that substantial technical assistance will be necessary to assist physicians with adoption and effective use of e-HIT. The experience of the FQHCs illustrates how a substantial amount of tailored technical assistance can assist providers with planning and decisions about e-HIT adoption.
- Timely, precise information will be necessary to assess the successful progress of e-HIT adoption. Getting reliable and complete information on a statewide basis will require careful survey and sampling design and vigorous follow-up to ensure that representative

data are gathered from providers who are active in e-HIT adoption as well as those who have not yet acquired systems. Survey instruments developed using recommendations from the report by Blumenthal and colleagues provide good content on EHR capabilities, incentives and barriers to adoption, and organizational characteristics. Moving forward, more work is required to test measures of interoperability and meaningful use of health records.

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Appendix

EHIT Medicaid Survey, working draft

Physician Characteristics

1.What is your current work status in medicine? (MARK ONLY ONE RESPONSE) (NJSPC, q3 modified)

____ Active in medicine (clinical, research, teaching or administration)

____Volunteer only

____Inactive in medicine (Go to demographics) *** check this skip

____Retired, not participating in medicine (Go to demographics) *** check this skip

____Deceased (please return survey in envelope provided)

2. How many hours do you typically spend per week for each activity at all practice locations? (modified NJSPC, q5)

Clinical Medicine (Includes documentation and paperwork related to patient care)
_____None (Go to demographics)
_____ # hours

Administration _____None _____ # hours

Research _____None _____ # hours

Teaching _____None _____ # hours

3. Do you provide direct patient care? (NJSPC, q17) ____ Yes ____ No

4. During your last normal week of practice, how many patient visits did you have at all locations? (NAMCS, q5)

_____ # patient visits

5. During your last normal week of practice, at how many locations did you regularly (i.e., once per week or more) provide patient care? (If you are a non-hospital based physician, do not include inpatient rounds). (NJSPC, q7 modified)

_____ # locations

6. At how many hospitals do you currently have clinical privileges? (NJSPC, q8 modified) _____ # hospitals

7. Location of medical school training. (MARK ALL THAT APPLY) (NJSPC, q9 modified)

____ New Jersey

____ Other US (including Puerto Rico)

____ Non-US

(**** specialty question not included as we think Medicaid has this information, if not, shorten the list we have ***)

8. In the next 24 months, do you plan to: (MARK ALL THAT APPLY) (NJSPC, q14)

____Retire from clinical medicine

____Significantly reduce clinical hours

____Move your practice to another geographic location in NJ

____Move your practice out of state

____No such changes anticipated

Use of computers in your *main practice site*

9. Does your main practice site have a computerized system for any of the following? For those features, please indicate the extent to which they are available to **you** and the extent to which **you** use them. If a feature is unavailable, check "no" to availability and skip the related "use" question. (NEJM, q101)

	Availability of Computerized System			**Use of Computerized System**			
	Yes	No	Don't Know	I do <u>not</u> use	I use *some* of the time	I use *most or all* of the time	Not applicable to my practice or specialty
Patient demographics	☐1	☐2	☐3	☐1	☐2	☐3	☐4
Patient problem lists	☐1	☐2	☐3	☐1	☐2	☐3	☐4
Orders for prescriptions?	☐1	☐2	☐3	☐1	☐2	☐3	☐4
If yes – are there warnings of drug interactions or contraindications provided?	☐1	☐2	☐3	☐1	☐2	☐3	☐4
If yes -- are prescriptions sent electronically to the pharmacy?	☐1	☐2	☐3	☐1	☐2	☐3	☐4
Orders for laboratory tests?	☐1	☐2	☐3	☐1	☐2	☐3	☐4
If yes – are orders sent electronically?	☐1	☐2	☐3	☐1	☐2	☐3	☐4
Orders for radiology tests?	☐1	☐2	☐3	☐1	☐2	☐3	☐4
*If yes -- a*re orders sent electronically?	☐1	☐2	☐3	☐1	☐2	☐3	☐4
Viewing Lab results?	☐1	☐2	☐3	☐1	☐2	☐3	☐4
If yes – are out-of-range levels highlighted?	☐1	☐2	☐3	☐1	☐2	☐3	☐4
Viewing Imaging results?	☐1	☐2	☐3	☐1	☐2	☐3	☐4
If yes – are electronic images returned?	☐1	☐2	☐3	☐1	☐2	☐3	☐4
Clinical notes?	☐1	☐2	☐3	☐1	☐2	☐3	☐4
If yes – do they include medical history and follow-up notes?	☐1	☐2	☐3	☐1	☐2	☐3	☐4
Electronic lists of what medications each patient takes?	☐1	☐2	☐3	☐1	☐2	☐3	☐4
Reminders for guideline-based interventions and/or screening tests?	☐1	☐2	☐3	☐1	☐2	☐3	☐4
Public health reporting?	☐1	☐2	☐3	☐1	☐2	☐3	☐4
*If yes—a*re notifiable diseases sent electronically?	☐1	☐2	☐3	☐1	☐2	☐3	☐4

10. How do you connect to the Internet? (KANM pg.5)

_____DSL
_____Cable
_____Dialup
_____Other
_____Don't know
_____Don't have a connection

11. Do all workstations have Internet access? (KANM pg.5) _____Yes _____No

(*** possibly move questions 12-14 before question 9 ***)

Acquisition and Implementation of an electronic health record (EHR) system

12. Does your *main* practice use an electronic health record (not including billing records)? (NEJM, q201)

□1 Yes, all electronic
□2 Yes, part paper, part electronic
□3 No
□4 Don't know

13. As of today, what is your degree of electronic health record acquisition or implementation at your main practice site [Choose one] (NEJM, q202) (*** check skips below when numbering is finalized ***)

□1 We have acquired an EHR system, but have not implemented it (go to Question 203).

□2 Our EHR implementation is in process (go to Question 203)

□3 We have fully implemented our EHR system (go to Section 300)

□4 We plan to acquire an EHR system in the next 12 months (go to Section 400)

□5 We plan to acquire an EHR system in the next 13 – 24 months (go to Section 400)

□6 We have no plans to acquire an EHR system (go to Section 400).

14. If you have purchased and are in the process of implementing an EHR system, when do you expect to have completed implementation? (NEJM, q203)

□1 in the next 12 months.

□2 in the next 13 to 24 months.

IF YOUR MAIN PRACTICE SITE USES PAPER RECORDS, PLEASE GO TO QUESTION 19. IF YOUR SITE USES ELECTRONIC HEALTH RECORDS OR IS IN TRANSITION TO AN EHR SYSTEM, PLEASE COMPLETE THE FOLLOWING SECTION.

15. Please indicate whether the EHR system at your *main practice site* allows patients to… (NEJM, q306)

	Yes	**No**	**Don't know**
View their medical record online	□1	□2	□3
Make changes to or update their medical record online	□1	□2	□3
Request appointments online	□1	□2	□3
Request referrals online	□1	□2	□3
Request refills for prescriptions online	□1	□2	□3

16. Is the electronic health record system at your main practice site integrated with a hospital system where you admit patients (i.e. your patient's ambulatory EHR is accessible through the hospital's EHR system)? (NEJM, q307)

Yes	No	Don't know
□1	□2	□3

17. If you use an electronic health record, does it meet CCHIT certification standards? (CCHIT is the Certification Commission for Health Information Technology) (NEJM, q308 modified)

Yes	No	Don't know
□1	□2	□3

18. Do you use electronic devices for any of the following: (NJSPC, q28 modified)

	Currently Use	Don't use now but likely to use in future	Don't use now/ not likely to use in future
a. Internet or Email to...			
...obtain information about treatment alternatives			
...communicate with your patients (if applicable)			
b. Other computer systems (e.g., handheld or bedside PC) to...			
...record prescriptions			
...record other medical record information			

Barriers to EHR adoption

19. Please answer the next set of questions, **regardless of whether your main practice site has acquired an EHR system or has not.** If your practice site has acquired an EHR system, please tell us how much of a barrier each of the following was. If your practice has not acquired an EHR, please indicate how much of a barrier it is to adoption, even if you have no immediate plans to adopt. (NEJM, q501)

	Major barrier	Minor barrier	Not a barrier
Financial Barriers			
The amount of capital needed to acquire and implement an EHR	□1	□2	□3
Uncertainty about the return on investment (ROI) from an EHR	□1	□2	□3
Organizational Barriers			
Resistance to adoption from practice physicians	□1	□2	□3
Capacity to select, contract, install and implement an EHR	□1	□2	□3
Concern about loss of productivity during transition to the EHR system	□1	□2	□3
Legal or Regulatory Barriers			
Concerns about inappropriate disclosure of patient information (i.e. breaches of patient confidentiality)	□1	□2	□3
Concerns about illegal record tampering or "hacking"	□1	□2	□3
Concerns about the legality of accepting an EHR that is donated from a hospital	□1	□2	□3
Concerns about physicians' legal liability if patients have more access to information in their medical records	□1	□2	□3
State of the Technology			
Finding an EHR system that meets providers' needs	□1	□2	□3
Concerns that the system will become obsolete	□1	□2	□3

Incentives for EHR adoption

20. Please rate the impact the following possible policy changes would have on your decision to adopt an EHR. If you have adopted an EHR, please rate the impact of the following possible policy changes on EHR adoption among physicians generally. Please indicate whether the impact was positive or negative. (modified NEJM, q601)

	Positive impact	No Impact	Negative impact
Legal or Regulatory Incentives			
Change the law to protect physicians from personal liability for record tampering by external parties or for privacy and security breaches	□1	□2	□3
Concerns about legal liability as a result of NOT using the latest Technology	□1	□2	□3
State of the Technology			
Published certification standards that indicate whether an EHR has the necessary capabilities and functions	□1	□2	□3
Financial Incentives			
Incentives for the purchase of an EHR (e.g. tax credits, low interest loans, grants)	□1	□2	□3
Additional payment for the use of an EHR (i.e. additional reimbursement for using an EHR)	□1	□2	□3
Availability of technical assistance and training in implementing and using an EHR	□1	□2	□3

21. In February 2009 President Obama signed the American Recovery and Reinvestment Act of 2009. This law provides approximately $20 billion as incentives for physicians and healthcare providers to use Electronic Medical Records (EMR). Were you familiar with this law prior to hearing about it in this survey? (WDT #6)

_____Yes _____No

22. Do you plan to investigate how your practice can obtain some of the incentive funding from the federal government to buy a new, or upgrade to a certified (such as CCHIT - Certification Commission for Healthcare Information Technology) EHR (Electronic Health Record) system? (WDT #7)

_____Yes _____No

NOTE: The following question is a placeholder for a Medicaid-specific item.

23. If the government structured the funding so that you would get the following payments to buy an EHR, which year are you most likely to purchase an EHR? (WDT #26)

_____ 2009 ($44,000 in Medicare incentives from 2011-2015)

_____ 2010 ($44,000 in Medicare incentives from 2011-2015)

_____ 2011 ($44,000 in Medicare incentives from 2011-2015)

_____ 2012 ($42,000 in Medicare incentives from 2012-2016)

_____ 2013 ($39,000 in Medicare incentives from 2013-2016)

_____ 2014 ($24,000 in Medicare incentives from 2014-2016)

_____ 2015 and beyond (No Medicare incentives, and lowered reimbursement rates)

_____ Not likely to ever purchase an EHR system

_____ Don't know

24. If after evaluating multiple EHR systems you conclude that the EHR best suited to your practice exceeded the incentive amounts offered for the EHR purchase, how likely are you to pay for the difference to get the EHR best suited for your office? (WDT #27)

_____ Definitely would pay the difference to get the EHR best suited for my practice

_____ Probably would pay the difference to get the EHR best suited for my practice

_____ Might or might not pay the difference to get the EHR best suited for my practice

_____ Probably would not pay for any system whose price was not completely covered by the incentive

_____ Definitely would not pay for any system whose price was not completely covered by the incentive

25. If incentives were provided for implementing and using an EHR, how likely would you expand the percentage of Medicaid patients in your practice? (CSHP)

_____ Not at all likely

_____Somewhat unlikely

_____Somewhat likely

_____Very likely

26. How effective do you think each of the following would be in improving the quality of care you provide your patients? (CSHP)

	Not at all effective	**Not very effective**	**Somewhat effective**	**Very effective**
Use of electronic prescribing				
Use of electronic medical records				
Reminders for guideline-based interventions or screening tests				
Use of email to communicate with patients				

*****IF YOU DO NOT PRACTICE IN NJ, PLEASE GO TO DEMOGRAPHICS*** (check skip when numbering finalized) (will all these docs have a NJ practice?)**

Practice Characteristics

27. What is the address of your New Jersey practice location where you spend the most time? (NJSPC, modified q15-1)

____If same as address to which survey was sent, mark here and continue to Question 28.

Street address: _____

Suite #: _____

City/Town: _____

County: _____

State: NJ Zip Code: _____

28. Please answer the following questions about your main New Jersey location noted in question 27:

a. How many of the following professionals work directly with you at this location? (NJSPC, q16c)

a. Physician Assistants ____None _____#
b. Advanced Practice Nurses (i.e., Nurse Practitioners or Clinical Nurse Specialists) ____None _____#
c. Certified Nurse Midwives ____None _____#
d. Certified Registered Nurse Anesthetists ____None _____#

b. Including yourself, how many physicians are at this location? _____ (modified NAMCS q11)

c. What best describes this practice location? (MARK ONE BELOW) (NJSPC, q16e modified with additions from NAMCS #7)

a. ____Private office
b. ____Community health center (e.g., FQHC or other federally-funded clinics)
c. ____Federal government operated clinic (e.g., VA, military, etc.)
d. ____Other government clinic, non-Federal
e. ____Other non-hospital-based health center/clinic
f. ____Hospital outpatient department
g. ____Hospital emergency department
h. ____Hospital inpatient service
i. ____Hospital - all other
j. ____Nursing home
k. ____Home health
l. ____Other (SPECIFY)_____

d. Are you a: _____ full-owner _____ part-owner _____ not an owner of the practice (MSPCT #5)

e. During your last normal week of practice, approximately how many patient visits did you personally have at this location? (modified NEJM, q007) _____ # patient visits

29. About what percentage of your patients have the following primary sources of payment? (NJSPC, q18)

Medicare _____ None _____ %
Medicaid/NJ Family Care _____ None _____ %
Uninsured/Self-pay _____ None _____ %
All Others (e.g., private insurance, Workers Compensation) _____ None _____ %

30. What percentage of your patients are in an HMO or other managed care plan?) (modified NJSPC, q19)

_____ None _____ %

31. Race/ethnicity of your patient population: (MARK ONE IN EACH ROW) (NJSPC, q23)
Hispanic/Latino _____ None _____ %
White/Caucasian (non-Hispanic) _____ None _____ %
Black/African American (non-Hispanic) _____ None _____ %
Asian or Pacific Islander (non-Hispanic) _____ None _____ %
Other _____ None _____ %

32. What percentage of your patients DO NOT communicate well in English? (MARK ONE) (NJSPC, q24)

____None ____1-10% ____11-25% ____26-75% ____76-100% ____Don't know

33. Mark the response that best describes your patient care practice status or activities: (NJSPC, q25) (CHECK ONE ONLY)

____I cannot accept any new patients

____I can accept some new patients

____I can accept many new patients

34. Are you accepting NEW patients with the following payment sources? (MARK ALL THAT APPLY) (NJSPC, q26)

Medicare _____ Yes _____No _____ Unknown

Medicaid _____ Yes _____No _____ Unknown

NJFamilyCare _____ Yes _____No _____ Unknown

Uninsured/self-pay _____ Yes _____No _____ Unknown

35. Which, if any, of the following are factors in determining the income of your practice? (CSHP)

	Not a factor	Minor factor	Major factor
Patient surveys			
Measures of clinical care			
Quality bonus or incentive payments from insurance plans			
Productivity or billing			

Demographics

36. Gender: ____Male ____Female (NJSPC, q33)

37. Year of Birth: _____ (NJSPC, q34)

38. Place of Birth: (NJSPC, q35)

____US (including Puerto Rico)

____Other (SPECIFY) _____

39. What is your racial/ethnic origin? (MARK ONE) (NJSPC, q36)

____Hispanic/Latino (Puerto Rican)

____Hispanic/Latino (All other)

____White/Caucasian (non-Hispanic)

____Black/African American (non-Hispanic)

____Asian or Pacific Islander (non-Hispanic)

____Other (SPECIFY) _____

40. What is your New Jersey medical license number? _____ (*** delete if Medicaid has this ***)(CSHP)

41. Who completed this survey? (NAMCS, q23)

____ the physician to whom it was addressed

____ office staff

____ other, specify _____

42. Who is the best contact in your practice in case we have follow up questions (please print)? (modified NEJM, conclusion)

Name: _____

Title:_____

Street address:_____

City:_____, State:_____ ZIP_____

Phone number: (_____)_____ext. _____

43. If you have any other comments or concerns regarding electronic health records, please list them here: (NJSPC, q38 modified)

_____

_____

_____

Question References

NJSPC: NJ State Physician Census, conducted in 2002 by CSHP
NEJM: National Survey of Health Record Keeping among Physicians & Group Practices in the US, conducted in 2007-08 by DesRoches et al., published in NEJM, vol. 359
NAMCS: National Ambulatory Medical Care Survey, Electronic Medical Records Supplement, conducted in 2008
MSPCT: Massachusetts Survey of Physician and Computer Technology
WDT: WhatDoctorsThink.com EMR Physician Survey (online)
KANM: Survey of Kentucky Ambulatory Network Members' Use of Information Technology, Univ. of Kentucky
CSHP: Developed by research staff at Rutgers Center for State Health Policy

Survey of Hospital EHR Adoption

Supplement to: Jha AK, DesRoches CM, Campbell EG, et al. Use of electronic health records in U.S. hospitals, N Engl J Med 2009; 360; 1628-38 DOI: 10.1056/NEJMsa0900592.

Appendix A: Questions from the survey used in the analysis

1. **Does your hospital have a computerized system for:** (Fully implemented means it has completely replaced paper record for the function)

	(1) Fully Implemented Across All Units	(2) Fully Implemented in At Least One Unit	(3) Beginning to Implement in At Least One Unit	(4) Have Resources to Implement in the Next Year	(5) Do not have Resources but Considering Implementing	(6) Not in Place and not Considering Implementing
Electronic Clinical Documentation						
a. Patient Demographics	☐	☐	☐	☐	☐	☐
b. Physician Notes	☐	☐	☐	☐	☐	☐
c. Nursing Assessments	☐	☐	☐	☐	☐	☐
d. Problem Lists	☐	☐	☐	☐	☐	☐
e. Medication Lists	☐	☐	☐	☐	☐	☐
f. Discharge Summaries	☐	☐	☐	☐	☐	☐
g. Advanced Directives (i.e. DNR)	☐	☐	☐	☐	☐	☐
Results Viewing						
a. Lab Reports	☐	☐	☐	☐	☐	☐
b. Radiology Reports	☐	☐	☐	☐	☐	☐
c. Radiology Images	☐	☐	☐	☐	☐	☐
d. Diagnostic Test Results (e.g., EKG report, Echo report)	☐	☐	☐	☐	☐	☐
e. Diagnostic Test Images (e.g., EKG tracing)	☐	☐	☐	☐	☐	☐
f. Consultant Reports	☐	☐	☐	☐	☐	☐
Computerized Provider Order Entry (Provider (e.g., MD, APN, NP) directly enters own orders)						
a. Laboratory Tests	☐	☐	☐	☐	☐	☐
b. Radiology Tests	☐	☐	☐	☐	☐	☐
c. Medications	☐	☐	☐	☐	☐	☐
d. Consultation Requests	☐	☐	☐	☐	☐	☐
e. Nursing Orders	☐	☐	☐	☐	☐	☐
Decision Support						
a. Clinical Guidelines (e.g., Beta blockers post-MI, ASA in CAD	☐	☐	☐	☐	☐	☐
b. Clinical Reminders (e.g., pneumovax)	☐	☐	☐	☐	☐	☐
c. Drug Allergy Alerts	☐	☐	☐	☐	☐	☐
d. Drug-Drug Interaction Alerts	☐	☐	☐	☐	☐	☐
e. Drug-Lab Interaction Alerts	☐	☐	☐	☐	☐	☐
f. Drug Dosing Support (e.g., renal dose guidance)	☐	☐	☐	☐	☐	☐
Bar Coding						
a. Laboratory specimens	☐	☐	☐	☐	☐	☐
b. Tracking pharmaceuticals	☐	☐	☐	☐	☐	☐
c. Pharmaceutical administration	☐	☐	☐	☐	☐	☐
d. Supply chain management	☐	☐	☐	☐	☐	☐
e. Patient ID	☐	☐	☐	☐	☐	☐
Other Functionalities						
a. Telemedicine	☐	☐	☐	☐	☐	☐
b. Radio Frequency ID	☐	☐	☐	☐	☐	☐
c. Physician Use of Personal Data Assistant	☐	☐	☐	☐	☐	☐

Please answer regardless of whether or not your hospital has implemented an EHR system.

If your hospital has implemented an EHR system, please tell us how much of a barrier each of the following was to implementation.

If your hospital has NOT implemented an EHR, please indicate how much of a barrier it is to implementation, even if you have no immediate plans to implement a system.

	(1) Major Barrier	(2) Minor Barrier	(3) Not a Barrier
a. The amount of capital needed to purchase and implement an EHR	☐	☐	☐
b. Uncertainty about the return on investment (ROI) from an EHR	☐	☐	☐
c. Concerns about the ongoing cost of maintaining an EHR system	☐	☐	☐
d. Resistance to implementation from physicians	☐	☐	☐
e. Resistance to implementation from other providers (e.g., RNs, NPs, Pas)	☐	☐	☐
f. Lack of capacity to select, contract for, and implement an EHR	☐	☐	☐
g. Disruption in clinical care during implementation	☐	☐	☐
h. Lack of adequate IT staff	☐	☐	☐
i. Concerns about inappropriate disclosure of patient information	☐	☐	☐
j. Concerns about the legality of donating a system to associated physician	☐	☐	☐
k. Concerns about illegal record tampering or "hacking"	☐	☐	☐
l. Finding an EHR system that meets your organization's needs	☐	☐	☐
m. Lack of interoperable IT systems in the market place	☐	☐	☐
n. Concerns about a lack of future support from vendors for upgrading and maintaining the system	☐	☐	☐

The table below lists potential policy solutions for suspected barriers to a hospital's implementation of an EHR.

- If your hospital HAS NOT implemented an EHR system please rate the impact that the proposed change in policy would have on your hospital's decision to implement an EHR. Please indicate whether the impact would be positive or negative.
- If your hospital HAS implemented an EHR, please rate the impact of the proposed change in policy on EHR implementation among hospitals generally. Please indicate whether the impact would be positive or negative.

	(1) Major Positive Impact	(2) Minor Positive Impact	(3) No Impact	(4) Minor Negative Impact	(5) Major Negative Impact
a. Change the law to protect physicians from personal liability for record tampering by external parties or for privacy and security braches	☐	☐	☐	☐	☐
b. Future HIPAA claims attachment	☐	☐	☐	☐	☐
c. Published lists of certified EHRs to assure presence of necessary capabilities and functions	☐	☐	☐	☐	☐
d. Objective evaluations of EHR capabilities and implementation experiences ("consumer reports" for EHRs)	☐	☐	☐	☐	☐
e. Technical assistance for implementation and process change	☐	☐	☐	☐	☐
f. Incentives for the purchase and implementation of an EHR (e.g., tax credits, low interest loans, grants)	☐	☐	☐	☐	☐
g. Additional reimbursement for the use of an EHR	☐	☐	☐	☐	☐

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