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The role of health information technology in care coordination in the US

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Abstract

Objectives: Examine the extent to which office-based physicians in the United States receive patient health information necessary to coordinate care across settings and determine if receipt of information needed to coordinate care is associated with use of health information technology (HIT), as measured by use of an electronic health record (EHR) system and electronic sharing of clinical data.

Study design: Cross-sectional study using the 2012 National Electronic Health Records Survey.

Subjects: Office-based physicians.

Measures: Use of HIT and three types of patient health information needed to coordinate care.

Results: In 2012, 64% of physicians routinely received the results of a patient's consultation with a provider outside of their practice while 46% routinely received a patient's history and reason for a referred consultation from a provider outside of their practice. About 54% of physicians reported routinely receiving a patient's hospital discharge information. Significant differences in receiving necessary information were observed by use of HIT. Compared with those not using HIT, a higher percentage of physicians using HIT received results of a patient's outside consultation and of a patient's history and reason for a referral from providers outside their practice. Among physicians routinely receiving information needed for care coordination, the majority did not receive the information electronically.

Conclusions: Although a higher percentage of physicians using HIT received patient information necessary for care coordination than those who did not use HIT, more than one-third did not routinely receive the needed patient information at all.

Keywords

care coordination; health information technology; electronic health record; NAMCS; NEHR

Introduction

The Institute of Medicine defined care coordination as *“the deliberate organization of patient care activities between two or more participants (including the patient) involved in a patient's care to facilitate the appropriate delivery of health care services and is often*

managed by the exchange of information among participants responsible for different aspects of care".¹ Care coordination can occur within and across settings of care and has been shown to provide better quality care at a lower cost.¹ Care coordination measures can be categorized into the framework of structure of care, process of care, and outcomes of care.² One key measure in process of care is whether patient information is being exchanged between providers. Several studies have suggested that the exchange of patient health information between primary care physicians and specialists in the US is not only lacking¹, but also lagging behind other countries.³ A prior report found that issues surrounding care coordination were the most common quality of care problems faced by physicians.⁴ In addition to problems exchanging patient health information between ambulatory providers, the exchange of patient health information between inpatient and outpatient settings is also inadequate.^{3,5} Studies have shown that outpatient physicians do not regularly receive discharge summaries needed to continue managing their patients after the patients are discharged from the hospital.^{3,5} Lack of coordination and communication across healthcare settings can lead to significant patient complications, including medication errors, preventable hospital readmissions, and emergency department visits.⁶

Use of health information technology (HIT) can include a wide range of activities from using individual computerized modules or web portals to using an interoperable electronic health record (EHR) system. HIT may facilitate the availability of health information needed for care coordination across healthcare settings because of more organized and easier data retrieval in the EHR system or electronic data exchange possibilities.^{7,8} However, being able to exchange data electronically does not automatically associate with better care coordination if the information needed is not exchanged between providers. Although electronic exchange of clinical data can be done through a variety of methods, EHR systems are usually used alone or in conjunction with other methods for electronic data transfer. The high costs associated with adoption and implementation historically have prevented the widespread use of HIT in the US.^{9,10} Using an EHR system to share patient information with other providers has been hampered by a lack of commercially available interoperable systems and standards for data sharing, and limited incentives for providers to exchange clinical data. Therefore, using an EHR system does not guarantee being able to exchange data electronically because both the sending and receiving parties need to have interoperable systems. As a result, many physicians may still use manual means of exchanging clinical data (e.g., letters or faxes) whether or not they have an EHR system. The Health Information Technology for Economic and Clinical Health (HITECH) Act of 2009 made investments to address these barriers and support increased health information exchange (HIE) capability and activity. The Act authorized financial incentives to encourage EHR adoption by health care professionals and hospitals.¹¹ To receive incentive payments, hospitals and eligible professionals need to demonstrate "meaningful use" of key EHR features, such as exchanging patient health information with other providers.¹² The HITECH Act also authorized over \$540 million in funding for the Office of the National Coordinator for Health Information Technology's State HIE Program, which provides support to states in establishing infrastructure that will enable providers to electronically exchange patient health information.¹³ The program complements many other public and private initiatives at the local, state, and national levels working to enable HIE.¹⁴ Despite these investments and

growing rates of EHR adoption in the US,¹⁵ evidence is still limited on the relationship between HIT use and care coordination.^{10,16}

This study uses 2012 national data to explore the extent to which office-based physicians in the US receive patient health information (electronically or non-electronically) needed to coordinate care with providers outside their practice, as well as with hospitals. The three types of patient health information needed for physicians to coordinate care include receipt of: results of a consultation for patients referred to outside providers, a patient's history and reason for referral from outside providers, and hospital discharge information. This study examines the association between receipt of each of the above types of patient information needed to coordinate care and use of HIT (as measured by use of an EHR system and whether the physician shared any type of patient health information electronically which can be done through EHR or other methods).

Methods

We used data from the 2012 National Electronic Health Records Survey (NEHRS), which was originally designed as a mail supplement to the National Ambulatory Medical Care Survey (NAMCS). The 2012 NAMCS NEHRS is an annual, nationally representative survey of office-based physicians that collects information on physicians' EHR systems and other physician and practice characteristics. Non-respondents to the mail survey received follow-up telephone calls. The survey was conducted by the Centers for Disease Control and Prevention's National Center for Health Statistics and sponsored by the Office of the National Coordinator for Health Information Technology.

The survey sampled 10,302 office-based physicians, excluding radiologists, anesthesiologists, and pathologists, in all 50 states and the District of Columbia.¹⁷ Of the sampled physicians, 4,545 physicians were in-scope and completed the survey, yielding an unweighted response rate of 67 percent (65 percent weighted). The data set is available for analysis through the Research Data Center at the National Center for Health Statistics.¹⁸

Receipt of patient health information necessary for care coordination

Patient health information necessary for care coordination included 1) results of a patient's consultation with an outside provider, based on the survey question "When you refer your patient to a provider outside of your office or group, do you receive a report back from the other provider with results of the consultation?"; 2) a patient's history and reason for a referred consultation from an outside provider, based on the question "When you see a patient referred to you by a provider outside of your office or group, do you receive notification of both the patient's history and reason for consultation?"; and 3) a patient's hospital discharge information, based on the question "When your patient is discharged from an inpatient setting, do you receive all of the information you need to continue managing the patient?" These questions allowed us to study receipt of patient health information necessary for care coordination between ambulatory care providers as well as between hospitals and ambulatory care providers. The information can be received electronically or through non-electronic methods. Responses to the questions regarding receipt of patient health information included "Yes, routinely", "Yes, but not routinely", and "No". Physicians who

received patient health information needed for care coordination were asked whether or not they received the information electronically (not fax).

Use of health information technology

Using HIT may facilitate transfer of the data needed for care coordination through electronic exchange of clinical data, which usually involves EHR systems, or through improved organization of information which can be easily retrieved by users of EHR systems. Therefore, we defined HIT use based on two measures - use of an EHR system and whether the physician shared patient health information electronically in addition to using an EHR system. Use of an EHR system was determined by responses to the question “Does the reporting location use an electronic health record (EHR) or electronic medical record (EMR) system? Do not include billing record systems.” Responses of “Yes, all electronic” and “Yes, part paper and part electronic” were counted as using an EHR system. Physicians’ electronic sharing of patient health information was based on “yes” responses to the question “Do you share any patient health information electronically (not fax) with other providers, including hospitals, ambulatory providers, or labs?” Based on these two measures, use of HIT in this study was categorized as “using an EHR system and sharing patient health information electronically”, “using an EHR system, but no electronic sharing of patient health information” and “not using HIT (not using an EHR system and no electronic sharing of patient health information)”. Of note, electronic sharing of patient health information does not necessarily imply that the information needed for care coordination is being transferred, as other types of information may be transferred instead. Respondents who reported that they had electronic sharing of patient health information, but did not use an EHR system were removed from some analyses (described below), as the sample size was too small (less than 3%) to be assessed as a separate group.

Other physician and practice characteristics

When examining the relationship between receipt of patient information necessary for care coordination and use of HIT, we also controlled for physician and practice characteristics found to be influential on the receipt of patient health information in the literature.^{19–23} These characteristics included physician age (45 years or younger, 45–54 years, 55 years or older); specialty type (primary care specialty [general and/or family practice, internal medicine, pediatrics, and obstetrics/gynecology], surgical specialty [includes all surgical specialties such as urology, plastic surgery, and abdominal surgery], and medical specialty [includes all other non-surgical medical specialties such as dermatology, cardiovascular disease, and neurology]); practice size as measured by the number of physicians at the location where the physician saw the most ambulatory care patients (1–2 physicians, 3–10 physicians, 11 or more physicians); ownership status (physician or physician group owned, other); and urbanicity²⁴ (large central metropolitan, large fringe metropolitan, medium metropolitan, small metropolitan or nonmetropolitan) of practice location.

Statistical analysis

Records missing on any of the variables used in the analysis were excluded from that specific analysis and the percent excluded due to missing information ranged from 5% to 7%. The analytic samples varied by analysis because the number of observations with

missing data for each type of patient information varied, as did the missing data for other variables included in a particular analysis. Specific missing information and sample sizes are available in the tables.

We examined the association between use of HIT and receiving patient health information necessary to coordinate care between providers. First, for each of three dependent variables (one variable for each of the three types of patient health information described above) we conducted bivariate multinomial logistic regressions using HIT use as the main independent variable and receipt of patient health information as the dependent variable. Routinely receiving necessary patient health information was the reference group for each of the dependent variables. We tested each variable using Chi-square test and then we conducted pairwise comparisons using Wald tests for variables with significant overall Chi-square test. We also conducted three multivariate multinomial regression models by adding other physician and practice characteristics (described above) as additional independent variables to each of the three bivariate regressions described above. Predictive margins from multinomial logistic regressions were used to obtain percentages. We only conducted pairwise comparisons if the overall F-test for a variable was significant in the multivariate logistic regression. Unadjusted and adjusted percentages of HIT use are presented in Table 2. Because of policymakers' interests in the ability of primary care physicians to exchange information needed to coordinate care¹², we also presented the unadjusted and adjusted percentages by specialty to show whether receipt of patient health information for care coordination was different by physician specialty groups. Full multivariate regression results are available in Appendix 1. Physicians who did not use EHR systems, but had electronic sharing of clinical data were not included in this analysis.

Finally, among the subset of physicians who routinely received information needed for care coordination, we assessed how frequent the information was received through electronic mechanisms (routinely, not routinely, no). Physicians who did not use EHR systems, but had electronic sharing of clinical data were included in this analysis.

All analyses used sample weights to create nationally representative estimates. Standard errors accounted for the complex sample design of the survey using the statistical analysis software SUDAAN. Statistical significance was assessed at the 0.05 level.

Results

In 2012, 48.5% of physicians were in a primary care specialty (Table 1). Almost 20% of physicians were in practices with 11 or more physicians. Slightly less than two thirds of physicians were in practices owned by a physician or physician group. Regarding use of HIT, 32.9% of physicians used an EHR system and shared patient health information electronically. Another 38.8% of physicians used an EHR system but did not share patient health information electronically. There were 25.4% of physicians who neither used an EHR system nor shared patient health information electronically.

The percentage of physicians receiving information needed to coordinate care varied by the type of information (Table 2). Table 2 shows that 64.3% of physicians reported routinely

receiving results of a patient's consultation with a provider outside of their practice; 45.5% of physicians reported routinely receiving the patient's history and reason for a referral consultation from a provider outside of their practice; and 54.4% of physicians reported routinely receiving hospital discharge information to continue to manage patients. For all three types of information, roughly one-third of physicians reported receiving the information but not routinely. Only 4.3% of physicians reported not receiving results of a patient's consultation with a provider outside of their practice, while 18.0% and 15.4% of physicians reported not receiving the patient's history and reason for a referred consultation from a provider outside of their practice, and hospital discharge information, respectively.

The percentage of physicians receiving different types of patient information varied by use of HIT (Table 2). In adjusted analyses, a lower percentage of physicians who used an EHR system and shared patient health information electronically failed to receive the results of outside consultations than those who did not use HIT (3.0% vs. 6.8%, $p<0.05$). A similar result was observed for patient's history and reason for a referred consultation; a lower percentage of physicians who used an EHR system and shared patient health information electronically failed to receive patient's history and reason for a referred consultation than those who did not use HIT (14.3% vs. 21.5%, $p<0.05$). In addition, a higher percentage of physicians who used an EHR system routinely received a patient's history and the reason for a referred consultation than those who did not use HIT (48.5% among those using an EHR system and shared data electronically and 46.6% among those using an EHR system, but no electronic sharing of data vs. 40.2%, $p<0.05$). No significant differences were observed for the receipt of hospital discharge information by use of HIT.

In adjusted analyses, some significant differences in receipt of the three types of information were observed by physician specialty (Table 2). A higher percentage of physicians in primary care specialties routinely received results of a patient's consultation with an outside provider than physicians in surgical or medical specialties (68.2% vs. 60.7% and 60.6%, $p<0.05$). On the other hand, a lower percentage of physicians in surgical or medical specialties failed to receive patient's history and reason for a referred consultation than physicians in primary care specialties (12.5% and 17.2% vs. 22.0%, $p<0.05$). About half (49.6%) of physicians in surgical specialties routinely received a patient's history and reason for a referred consultation, compared to 43.1% of physicians in primary care specialties. A higher percentage of physicians in medical specialties failed to receive hospital discharge summaries compared with physicians in primary care specialties (19.5 vs. 12.8%, $p<0.05$).

Among physicians routinely receiving patient health information needed to coordinate care, the majority did not electronically receive results of an outside consultation (75.7%) or a patient's history and reason for a referred consultation (76.1%) (Table 3). About half (54.0%) of physicians who routinely received hospital discharge information did not receive that information electronically.

Discussion

In 2012, substantial gaps existed in the availability of patient health information necessary for care coordination among US office-based physicians. About one-third of physicians did

not routinely receive results of a consultation for a patient referred to another provider outside of their practice. About one-half of physicians did not routinely receive a patient's history and the reason for a consultation when a patient was referred from a provider outside of their practice. Similarly, about one-half of physicians did not routinely receive discharge information to continue managing patients after patients had been hospitalized. These findings are consistent with previous studies conducted over the past decade, illustrating the persistent challenge of enabling information to routinely follow patients across care settings.³⁻⁵

A higher percentage of physicians who used an EHR system and electronically shared clinical data received certain types of patient health information for care coordination more often than those who did not use HIT. However, even among physicians with EHRs and the capability to share information electronically, 14.3% and 13.1% did not receive patient's history and the reason for a referred consultation, and hospital discharge summaries, respectively. Additionally, among physicians routinely receiving patient health information for care coordination, the majority did not receive the information electronically. These results suggest that EHR adoption and the capability for electronic sharing of patient health information among office-based physicians alone may not be enough to ensure the regular sharing of key information for care coordination.

Improving the availability of patient health information across health care settings and enhancing the role that EHRs play in care coordination are the goals of several ongoing federal initiatives.¹⁴ For patient health information to flow electronically across care settings, there must be widespread adoption of interoperable EHRs or other HIT tools that enable electronic information sharing. The Medicare and Medicaid EHR Incentive Programs are designed to support increased adoption of interoperable EHRs. As of February 2013, over 7 in 10 eligible professionals and over 8 in 10 eligible hospitals were registered to participate in the Incentive Programs.²⁵ To qualify for incentive payments under the second stage of the Incentive Programs (beginning in 2014), eligible professionals and hospitals must electronically share summary of care records in a structured format and demonstrate the capability to share records with providers who have EHR systems different from their own.²⁶ Other federal policies are creating incentives for providers to coordinate care across settings, through the use of new payment models such as shared savings programs, hospital readmission payment adjustments, bundled payments, and patient-centered medical homes.^{27,28}

Our results also document variation in the availability of patient health information needed to coordinate care by physician specialty group. Information necessary for care coordination was especially lacking for physicians in medical specialties when their patients were discharged from the hospital (19.5% among physicians in medical specialties did not receive discharge information compared with 12.8% among primary care physicians). Like primary care physicians, medical specialists can play an important role in post-discharge care, especially for patients with complex conditions.²⁹ Our findings are consistent with the main role for each type of physician: primary care physicians are more likely to refer patients to other providers while specialists are more likely to receive consultations.³⁰ Specifically, a higher proportion of primary care physicians routinely received results of consultations for

patients referred outside of their practice. In contrast, a higher proportion of physicians in medical or surgical specialties routinely received a patient's history and the reason for a consultation referred to them.

This study has limitations. The data were self-reported and subject to potential measurement error. EHR adopters may be more likely to respond to the survey, potentially leading to overestimates of EHR usage. Our measures of HIT -- using an EHR system and sharing any patient health information electronically (regardless of whether it is done through an EHR system) -- are relatively broad due to the wording of survey questions. The survey included a question on the methods used for sharing patient information electronically in general. However, it did not measure the methods by which the patient information of interest in the study was received. More detailed information on the specific EHR and electronic data sharing mechanisms may have yielded more nuanced results regarding the types of HIT that facilitate care coordination. In addition, we acknowledge that sharing patient health information electronically does not necessarily mean that the information needed for care coordination was the specific information that was shared electronically.

In conclusion, we found that a higher percentage of physicians who used EHR and shared clinical data electronically received health information necessary for care coordination than those who did not use HIT. However, among physicians who used HIT, at least one-third, and sometimes more than half, of them did not routinely receive patient information to coordinate care. Our findings inform our understanding of continuing challenges to using HIT to coordinate care between providers.

Appendix

Appendix 1.

Associations between physician characteristics and receiving information needed to coordinate care with providers outside of their practice (full regression results).

Physician and practice characteristics	Receive results of a consultation for patients referred to providers outside of their practice (n=4,221)		Receive a patient's history and reason for consultation for patients referred from providers outside of their practice (n=3,751)		Receive discharge information for hospitalized patients (n=4,032)	
	"Not routinely" compared with "routinely"	"No" compared with "routinely"	"Not routinely" compared with "routinely"	"No" compared with "routinely"	"Not routinely" compared with "routinely"	"No" compared with "routinely"
	Odds ratio	Odds ratio	Odds ratio	Odds ratio	Odds ratio	Odds ratio
Age						
44 years or younger	Reference	Reference	Reference	Reference	Reference	Reference
45–54 years	1.01	1.87	1.09	0.92	0.75*	0.90
55 years or older	1.03	1.48	1.18	1.11	0.94	1.01

	Receive results of a consultation for patients referred to providers outside of their practice (n=4,221)		Receive a patient's history and reason for consultation for patients referred from providers outside of their practice (n=3,751)		Receive discharge information for hospitalized patients (n=4,032)	
	"Not routinely" compared with "routinely" Odds ratio	"No" compared with "routinely" Odds ratio	"Not routinely" compared with "routinely" Odds ratio	"No" compared with "routinely" Odds ratio	"Not routinely" compared with "routinely" Odds ratio	"No" compared with "routinely" Odds ratio
Specialty ¹						
Primary care	Reference	Reference	Reference	Reference	Reference	Reference
Surgical	1.37 [*]	1.66	0.94	0.48 [*]	0.81	1.20
Medical	1.36 [*]	1.80	1.01	0.73	1.06 [*]	1.71
Practice size						
1–2 physicians	Reference	Reference	Reference	Reference	Reference	Reference
3–10 physicians	0.81	0.60	1.03	0.92	0.99	0.61 [*]
11 or more physicians	0.92	1.02	1.27	1.14	1.17	0.63
Ownership						
Physician or physician group	Reference	Reference	Reference	Reference	Reference	Reference
Other ²	1.28 [*]	2.29 [*]	0.96	1.34	1.25	1.20
Urbanicity						
Large central metropolitan	Reference	Reference	Reference	Reference	Reference	Reference
Large fringe metropolitan	0.65 [*]	0.56	1.13	1.56 [*]	0.85	1.01
Medium metropolitan	0.70 [*]	0.60	0.63 [*]	0.59 [*]	0.77	0.92
Small metropolitan or nonmetropolitan	0.54 [*]	0.40 [*]	0.51 [*]	0.44 [*]	0.53 [*]	0.45 [*]
Use of health information technology (HIT)						
Not using HIT	Reference	Reference	Reference	Reference	Reference	Reference
EHR, but no electronic sharing of data	0.97	0.54	0.78	0.74	1.03	1.05
EHR and electronically sharing data	0.96	0.42 [*]	0.80	0.54 [*]	0.86	0.74

Source: 2012 National Electronic Health Records Survey.

Note: Data exclude missing on use of health information technology, ownership, and receiving relevant information. Percent missing ranged from 6% to 7%.

Practice size is based on the location where the physician saw the most ambulatory care patients. Practice size may be inaccurate.

EHR is electronic health record.

* Significantly different from the reference group ($p < 0.05$).

¹Primary care includes family practice, pediatrics, obstetrics/gynecology, and internal medicine. Surgical includes all surgical specialties such as urology, plastic surgery, and abdominal surgery. Medical includes all other non-surgical medical specialties such as dermatology, cardiovascular disease, and neurology. For the complete list of all physician specialties and specialty types, please visit the Public Use Data File documentation, available at: ftp://ftp.cdc.gov/pub/Health_Statistics/NCHS/Dataset_Documentation/NAMCS/doc2010.pdf.

²Other ownership arrangements are defined as health maintenance organizations, community health centers, medical/academic health centers, other hospitals, other health care organizations, and other.

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Table 1.

Physician and practice characteristics of the respondents to the 2012 National Electronic Health Records Survey

	Percent of sample (n=4,545)
All physicians	100.0
Physician and practice characteristics	
Age	
45 years or younger	25.2
45–54 years	31.5
55 years or older	43.3
Specialty ¹	
Primary care	48.5
Surgical	22.5
Medical	29.1
Practice size	
1–2 physicians	38.1
3–10 physicians	42.3
11 or more physicians	19.5
Ownership	
Physician or physician group	63.1
Other ²	35.4
Unknown	1.5
Urbanicity	
Large central metropolitan	35.2
Large fringe metropolitan	24.3
Medium metropolitan	20.6
Small metropolitan or nonmetropolitan	19.9
Use of health information technology (HIT)	
Not using HIT	25.4
EHR, but no electronic sharing of data	38.8
EHR and electronically sharing data	32.9
Unknown	2.9

Source: 2012 National Electronic Health Records Survey.

Note: EHR is electronic health record. Practice size was based on the location where the physician saw the most ambulatory care patients.

¹Primary care includes family practice, pediatrics, obstetrics/gynecology, and internal medicine. Surgical includes all surgical specialties such as urology, plastic surgery, and abdominal surgery. Medical includes all other non-surgical medical specialties such as dermatology, cardiovascular disease, and neurology. For the complete list of all physician specialties and specialty types, please visit the Public Use Data File documentation, available at: ftp://ftp.cdc.gov/pub/Health_Statistics/NCHS/Dataset_Documentation/NAMCS/doc2010.pdf.

²Other ownership arrangements are defined as health maintenance organizations, community health centers, medical/academic health centers, other hospitals, other health care organizations, and other.

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Table 2.

Percent of physicians receiving information needed to coordinate care with providers outside of practice and adjusted percent receiving information by use of health information technology and physician specialty.

	Receive results of a consultation for patients referred to providers outside of their practice			Receive a patient's history and reason for consultation for patients referred from providers outside of their practice			Receive discharge information for hospitalized patients		
	Routinely	Not routinely	No	Routinely	Not routinely	No	Routinely	Not routinely	No
All physicians ¹	64.3	31.4	4.3	45.5	36.5	18.0	54.4	30.2	15.4
Unadjusted percent among all physicians									
Use of health information technology									
No EHR use	61.9	31.5	6.6	40.6	38.7	20.8	52.7	29.4	18.0
EHR, but no electronic sharing of data	65.4	31.0	3.6	46.6	34.9 ^a	18.5	52.8	30.7	16.5
EHR and electronically sharing data	65.0	31.7	3.3 ^a	48.3 ^a	36.7	15.0 ^a	57.5	30.3	12.2 ^a
Physician specialty ²									
Primary care	68.5	28.3	3.2	44.1	34.3	21.6	55.7	31.4	12.9
Surgical	61.2 ^b	33.8	5.0	48.9	38.6	12.5 ^b	57.9	26.9	15.2
Medical	59.6 ^b	34.7 ^b	5.7	44.7	37.7	17.6	49.5 ^b	30.7	19.9 ^b
Adjusted percent among all physicians ³									
Use of health information technology (HIT)									
Not using HIT	62.2	31.0	6.8	40.2	38.3	21.5	53.0	30.8	16.2
EHR, but no electronic sharing of data	64.7	31.4	3.9	46.6 ^a	34.7	18.7	52.3	31.1	16.7
EHR and electronically sharing data	65.4	31.6	3.0 ^a	48.5 ^a	37.2	14.3 ^a	57.9	29.0	13.1
Physician specialty									
Primary care	68.2	28.4	3.4	43.1	34.9	22.0	55.5	31.7	12.8
Surgical	60.7 ^b	34.4 ^b	4.9	49.6 ^b	37.9	12.5 ^b	57.5	26.6	15.8
Medical	60.6 ^b	34.1 ^b	5.3	45.4	37.4	17.2 ^b	50.1	30.4	19.5 ^b

Source: 2012 National Electronic Health Records Survey.

Note: EHR is electronic health record. Data exclude missing on use of health information technology, ownership, and receiving relevant information. Percent missing ranged from 6% to 7%.

¹ Sample size for each model varied: 4,221 for results of the consultation; 3,715 for patient's history and reason for consultation; and 4,032 for discharge information.

² Primary care includes family practice, pediatrics, obstetrics/gynecology, and internal medicine. Surgical includes all surgical specialties such as urology, plastic surgery, and abdominal surgery. Medical includes all other non-surgical medical specialties such as dermatology, cardiovascular disease, and neurology. For the complete list of all physician specialties and specialty types, please visit the Public Use Data File documentation, available at: ftp://ftp.cdc.gov/pub/Health_Statistics/NCHS/Dataset_Documentation/NAMCS/doc2010.pdf.

³ Adjusted for use of HIT, specialty type, physician age, practice size, ownership, and metropolitan status. Sample size for each model varied: 4,221 for results of a consultation; 3,715 for patient's history and reason for consultation; and 4,032 for hospital discharge information.

^a Significantly different from "Not using HIT" ($p < 0.05$).

^b Significantly different from "primary care specialty" ($p < 0.05$).

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Table 3.

Percentage of physicians routinely receiving information needed to coordinate care by whether the information is received electronically.

	Routinely receive results of a consultation for patients referred to providers outside of their practice (n=2,821)	Routinely receive a patient's history and reason for consultation for patients referred from providers outside of their practice (n=1,914)	Routinely receive discharge information for hospitalized patients (n=2,388)
Manner in which information to coordinate care is received			
Routinely receive information electronically	9.3	10.9	34.7
Receive information electronically, but not routinely	15.0	13.0	11.3
Does not receive information electronically	75.7	76.1	54.0

Source: 2012 National Electronic Health Records Survey.

Note: Data exclude missing on receiving relevant information electronically (2%–3%).

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