

Supplementary Appendix

This appendix has been provided by the authors to give readers additional information about their work.

Supplement to: DesRoches CM, Campbell EG, Rao SR, et al. Electronic health records in ambulatory care — a national survey of physicians. *N Engl J Med* 2008;359:50-60. DOI: [10.1056/NEJMsa0802005](https://doi.org/10.1056/NEJMsa0802005).

Summary protocol

Research Design and Methods:

The physician survey was developed by the study team. Along with Research Triangle Institute (RTI), the study team submitted the survey instrument for the Office of Management and Budget (OMB) approval through the U.S. Department of Health and Human Services. Following response to OMB revisions, the study team conducted 10 cognitive interviews with physicians in order to refine the survey items. The survey was revised based on these interviews and pretested with 100 randomly selected respondents.

The study team fielded the survey in collaboration with RTI. The survey was mailed to respondents with a cover letter and instructions for completion and returning of the survey. Physicians were queried about the following: use of EHRs, plans for adoption, barriers to and incentives for adoption, individual components of the EHR system at their practice (including Computerized Physician Order Entry, decision support, etc), satisfaction with their system, and perceived benefits for patient care. The survey took 20 minutes. RTI was responsible for identifying the sample of physicians. The physicians survey was mailed to 5,000 subjects across the country. The survey sample was developed in order to create a representative national sample. Follow-up phone calls and letters were sent to non-respondents. The initial mailing included a \$20 incentive to encourage participation. A subsequent mailing included a \$40 check.

Before data analysis of each survey, RTI removed all individual identifiers from the survey data before sending it to the research partners at Partners/MGH, Partner/BWI, and George Washington University. Data analyses was done primarily at Partners/MGH with assistance from project team members at Partners/BWI and George Washington University.

Privacy and confidentiality:

The sample list (with respondent names and contact information) was available only to authorized personnel at RTI. RTI's Institutional Review Board approved the list project staff requiring access. Data was stored in a password protected network environment. To protect respondent confidentiality, RTI encrypted identifiable data that are stored on company-issued personal computers. All RTI staff with access to respondent information (including phone center staff and those who prepare documents for shipping) are required to sign confidentiality agreements. These agreements are enforced, and penalties for violation include termination of employment. As mailed data are being prepared for shipment or as they are returned, they will be stored in a secure environment, regardless of the form in which data are returned. Access to electronic data is controlled by password protection. Buildings are protected by a security force and locked entryways. Any ID number assigned to a respondent will be de-linked from personally identifying information at the end of data collection. Any files linking identifiable information and an ID will be stored in a secure environment. After data collection, electronic files with names and address information will be destroyed. No hard-copy forms of the list will be produced

A National Survey of Health Record Keeping among Physicians & Group Practices in the United States

000. Practice Characteristics

01. At how many different office locations do you see ambulatory patients?

- ₁ One
- ₂ Two
- ₃ Three or more
- ₄ None, I do not see any outpatients

*If you practice at more than one location, please keep in mind your **main practice site** for the remaining questions.*

*By "main practice site" we mean the location at which **you see the most ambulatory patients**.*

002. During a typical week, what percent of your patient visits are provided at your *main practice site*?

- ₁ Less than 25%
- ₂ 25%-49%
- ₃ 50% - 75%
- ₄ More than 75%

003. How many physicians are associated with you, at your main practice site? _____.

004. Is your main practice site a single-specialty practice, or a multi-specialty practice?

- ₁ Single specialty group or partnership
- ₂ Multi-specialty group or partnership

005. What is the primary setting of your main practice site?

- ₁ Hospital, medical-center.
- ₂ Ambulatory surgical center.
- ₃ Urgent-care facility.
- ₄ Laboratory or imaging center, outside a hospital.
- ₅ A physician office not attached to a hospital, or on a medical center campus.

006. About what percentage of your patients in your main practice site:

	Less than 10%	10% to less than 25%	25% to less than 50%	50% or more
a. are uninsured (do <u>not</u> have health insurance coverage)?	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
b. are covered by <u>Medicaid</u> (including managed care)?	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
c. are African American or Black?	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
e. are Hispanic or Latino?	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
f. have a primary language <u>other than English</u> ?	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄

007. During your last full week of work, approximately how many patient visits did you personally have at your main practice site?

_____.

100. Use of computers in your main practice site

101. 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.

	Availability			Use			
	Yes	No	Don't Know	I do <u>not</u> use	I use <i>some</i> of the time	I use <i>most</i> or <i>all</i> of the time	Not applicable to my practice or specialty
a) Patient demographics	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
b) Patient problem lists	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
c) Orders for prescriptions?	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
d) <i>If yes – are there warnings of drug interactions or contraindications provided?</i>	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
e) <i>If yes -- are prescriptions sent electronically to the pharmacy?</i>	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
f) Orders for laboratory tests?	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
g) <i>If yes – are orders sent electronically?</i>	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
h) Orders for radiology tests?	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
i) <i>If yes -- are orders sent electronically?</i>	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
j) Viewing Lab results?	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
k) <i>If yes – are out-of-range levels highlighted?</i>	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
l) Viewing Imaging results?	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
m) <i>If yes – are electronic images returned?</i>	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
n) Clinical notes?	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
o) <i>If yes – do they include medical history and follow up notes?</i>	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
p) Electronic lists of what medications each patient takes?	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
q) Reminders for guideline-based interventions and/or screening tests?	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
r) Public health reporting?	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
s) <i>If yes—are notifiable diseases sent electronically?</i>	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄

200. Acquisition and Implementation of an EHR system

201. Does your *main* practice use an electronic health record (not including billing records)?

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

202. As of today, what is your degree of electronic health record acquisition or implementation at your main practice site [Choose one]

- 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).

203. If you have purchased and are in the process of implementing an EHR system, when do you expect to have completed implementation?

- 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 SECTION 400.

IF YOUR SITE USES ELECTRONIC HEALTH RECORDS OR IS IN TRANSITION TO AN EHR SYSTEM PLEASE COMPLETE THE FOLLOWING SECTION.

300. Experience with Electronic Health Records

301. How many years have you been using an EHR in your main practice site? _____ years.

302. To what extent has the EHR system affected the following areas at your main practice site?

	Major positive impact	Positive impact	No impact	Negative impact	Major negative impact	Not applicable
a) The quality of clinical decisions	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅	<input type="checkbox"/> ₆
b) Communication with other providers	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅	<input type="checkbox"/> ₆
c) Communication with your patients	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅	<input type="checkbox"/> ₆
d) Prescription refills	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅	<input type="checkbox"/> ₆
e) Timely access to medical records	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅	<input type="checkbox"/> ₆
g) Avoiding medication errors	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅	<input type="checkbox"/> ₆
f) Delivery of preventive care that meets guidelines	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅	<input type="checkbox"/> ₆
g) Delivery of chronic illness care that meets guidelines	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅	<input type="checkbox"/> ₆

303. In providing patient care since adopting an EHR system at your main practice site, have you

	Yes		No	Not applicable
	In the last 6 months	Ever		
a) Avoided a drug allergy because of an EHR?	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
b) Avoided a potentially dangerous medication interaction because of an EHR?	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
c) Been alerted to a critical lab value by an EHR?	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
d) Provided preventive care (e.g., vaccine, colonoscopy, mammogram) because you were prompted by an EHR?	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
e) Ordered a critical lab test (such as HbA1c or LDL) as a result of an electronic prompt from an EHR?	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
f) Ordered a genetic test as a result of a prompt from an EHR?	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄

304. Overall, how satisfied are you with the EHR system at your main practice?

Very satisfied	Somewhat satisfied	Somewhat dissatisfied	Very dissatisfied
<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄

305. How satisfied are you with each of the following aspects of your EHR system?

	Very satisfied	Somewhat satisfied	Somewhat dissatisfied	Very dissatisfied
a) Ease of use when providing direct care to a patient	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
b) Reliability of the system (i.e. frequency of system failures, system speed)	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
c) Sharing of medical information with hospitals and other health-care providers	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄

306. Please indicate whether the EHR system at your *main practice site* allows patients to...

	Yes	No	Don't know
	a. View their medical record online	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂
b. Make changes to or update their medical record online	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃
c. Request appointments online	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃
d. Request referrals online	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃
e. Request refills for prescriptions online	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃

307. 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)?

- Yes ₁ No ₂ Don’t know ₃

308. If you use an electronic health record, does it meet certification standards?

- Yes ₁ No ₂ Don’t know ₃

400. Use of E-mail

401. Please indicate how frequently you communicate by e-mail with each of the following:

	Never	Rarely	Sometimes	Frequently
a) Patients about medical issues	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
b) Other physicians in your practice about patient care	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
c) Other staff in your practice about patient care	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄
d) Other physicians who are not in your practice about patient issues	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄

500. Barriers to EHR adoption

501. 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.

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

600. Incentives for EHR adoption

601. 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.

	Major positive impact	Minor positive impact	No Impact	Minor negative impact	Major negative impact
Legal or Regulatory Incentives					
a. Change the law to protect physicians from personal liability for record tampering by external parties or for privacy and security breaches	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅
b. Concerns about legal liability as a result of NOT using the latest technology	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅
State of the Technology					
c. Published certification standards that indicate whether an EHR has the necessary capabilities and functions.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅
Financial Incentives					
d. Incentives for the purchase of an EHR (e.g. tax credits, low interest loans, grants)	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅
e. Additional payment for the use of an EHR (i.e. additional reimbursement for using an EHR).	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅

602. Has your practice purchased any of the following *in the last three years*?

	Yes	No	Don't know
New examining rooms	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃
An x-ray or imaging machine	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃
Acquired, or opened another practice site	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃
Clinical laboratory equipment	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃

900. Physician and practice characteristics

901. What is the year of your birth? 19_____

902. What is your gender?

₁ Male ₂ Female

903. What is your ethnicity?

₁ Hispanic or Latino
₂ Not Hispanic or Latino

Please turn to the next page.

904. What is your race? (check all that apply)

- ₁ White
- ₂ Black/African American
- ₃ Asian
- ₄ Native Hawaiian/Other Pacific Islander
- ₅ American Indian/Alaska Native

905. In what area are you board certified?

906. Regardless of board certification, what do you consider your main specialty?

907. In what year did you first practice medicine, after completing residency or fellowship?

_____.

908. Roughly, what percent of your patient care revenue comes from (note: percentage should total to 100%)?

- ____ Medicare
- ____ Medicaid
- ____ Private insurance
- ____ Patient payments
- ____ Other _____.

If you have an office manager or practice manager, please let us know how we can reach that person in case we have follow up questions (please print):

Name: _____

Title: _____

Street address: _____

City: _____, **State:** _____ **ZIP** _____

Phone number: (_____) _____ **ext.** _____

THANK YOU FOR COMPLETING THIS FORM.

PLEASE RETURN IT IN THE ENCLOSED ENVELOPE.

Technical Appendix

Physicians were asked about the impact of their EHR on each of the following: the quality of clinical decisions, quality of communication with patients, quality of communication with other providers, prescription refills, timely access to medical records, avoiding medication errors, delivery of preventive care that meets guidelines, and delivery of chronic care that meets guidelines. Response categories were: major positive impact, positive impact, no impact, negative impact, major negative impact, and not applicable. These were combined into two categories: positive impact and neutral/negative impact (this included no impact, negative impact, and major negative impact). Subjects who responded as ‘not applicable’ were excluded from the analysis.

To further assess the impact of EHRs on patient care, physicians with EHRs were asked to report whether they had done each of the following due to a prompt from their EHR: avoided a drug allergy, avoided a potentially dangerous medication interaction, been alerted to a critical lab value, provided preventive care, ordered a critical lab test, or ordered a genetic test. Response categories were “yes, ever”, “yes, in the past 6 months”, “no”, and “not applicable”. Physicians who responded “not applicable” were excluded from the analysis.

To assess the extent to which physicians’ EHR systems allowed patients to interact with the system, the survey asked the following question: “does your EHR allow patients to do each of the following?” Survey items were: view medical records online, make changes or update their medical record online; request appointments online; request referrals online; request refills for prescriptions online. Physicians were instructed to answer “yes”, “no”, or “don’t know” for each item.

To assess satisfaction with EHR systems, physicians were asked to rate their level of satisfaction with each of the following: the system overall, ease of use when providing patient care, reliability of the system, and sharing of medical information. The satisfaction variables had four response categories (very satisfied, somewhat satisfied, somewhat dissatisfied, and very dissatisfied). These were combined into two categories: satisfied and dissatisfied. Physicians who did not respond to any of the items were excluded from the analysis.

Physicians were asked to rate the impact of each of the following barriers on their decision to adopt an EHR: the amount of capital needed to purchase an EHR; uncertainty about the return on investment; resistance from physicians in the practice; uncertainty about their capacity to select, contract for, install, and implement a system; concerns about a loss of productivity during the implementation; concerns about inappropriate disclosure of patient information; concerns about illegal record tampering; concerns about the legality of accepting a donated EHR; concerns about physicians legal liability; finding and EHR that meets the providers needs; and concerns that the system will become obsolete. The barrier variables had three response categories (major barrier, minor barrier, and not a barrier). We included all of the categories in the logit model, however we do not show the “not a barrier” estimates in Table 5.

The survey asked physicians about the impact of each of the following facilitators of EHR adoption: financial incentives for the purchase of an EHR system, additional payments for the use of an EHR, concerns about legal liability for not using an EHR, published certification standards, and protections against legal liability for record tampering. Response categories were major positive impact, minor positive impact, no

impact, minor negative impact, major positive impact. We report on the proportion of physicians who responded that a facilitator would have a major positive impact.

Physicians were asked to report on the proportion of patients in their practice who: were uninsured, were covered by Medicaid, were African American, were Hispanic, and spoke a primary language other than English. Physicians were asked to estimate the proportion separately for each group. Response categories for each were less than 10%, 10% to less than 25%, 25% to less than 50%, or 50% or more. For each variable, responses were dichotomized into less than 25% and 25% or more. These variables were included in a cumulative logit model that adjusted for all of the other variables shown in Table 3. None of the variables were a significant predictor of EHR availability.