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## Care Coordination and Comprehensive Electronic Health Records are Associated with Increased Transition Planning Activities

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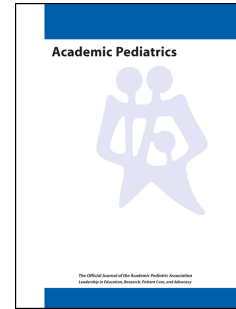


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# Accepted Manuscript

Care Coordination and Comprehensive Electronic Health Records are Associated with Increased Transition Planning Activities

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**Title Page**Title

Care Coordination and Comprehensive Electronic Health Records are Associated with Increased Transition Planning Activities

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### Abbreviations

MU – Meaningful Use; EHR – Electronic Health Records; YSHCN – Youth with Special Health Care Needs; AAP – American Academy of Pediatrics; CMS – Centers for Medicare and Medicaid Services; PS – Periodic Survey; CEHR - Comprehensive Electronic Health Record

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### Conflicts of Interest

None of the authors report any financial relationships relevant to this article, conflicts of interest, or corporate sponsors to disclose.

## Abstract

### Objective

Youth with Special Health Care Needs (YSHCN) require assistance from their pediatricians to transition to adult care. There is little data on what transition resources pediatricians have. This paper studies if care coordination and/or comprehensive electronic health record (CEHR) implementation are associated with improved transition processes.

### Methods

Using AAP Periodic Survey #79, we report whether practices generated written transition plans, assisted in finding adult providers, and discussed confidentiality issues. Descriptive statistics and a logistic regression model were done to evaluate whether CEHR, care coordination, or practice and physician characteristics improve transition planning.

### Results

Transition planning support in practices is low. Pediatricians with any care coordinator report more written transition plans for YSHCN (23% vs. 6%,  $p<0.001$ ), assistance identifying adult providers (59% vs. 39%,  $p<0.001$ ), and discussing confidentiality issues (50% vs. 33%,  $p<0.001$ ). Pediatricians with a CEHR compared to those without are more likely to report written transition plans for YSHCN (24% vs. 12%  $p<0.05$ ) and discussing confidentiality issues (51% vs. 39%,  $p<0.05$ ). In the logistic regression model, having care coordination (AOR 11.1, 95% CI 5.9-21.3) and CEHR (AOR 2.6, 95% CI 1.5-5.0) are independently associated with higher odds of having a written transition plan.

### Conclusions

Only 1 in 5 pediatricians have a transition coordinator in their practice and just 15% have a CEHR, even as these resources are associated with improved transition processes for YSHCN. Policy decisions should be made to help practices with supports, such as care coordination and EHR implementation, in order to improve transitions to adulthood.

### What's New

Current AAP recommendations call for pediatricians to assist in transition planning and preparedness for YSHCN. Pediatricians in practices with a transition coordinator or care coordinator and a CEHR are more likely to report improved transition processes.

## Introduction

Youth with Special Health Care Needs (YSHCN) face numerous challenges as they transition from pediatric to adult-centered care.<sup>1-5</sup> To address these barriers, the American Academy of Pediatrics (AAP) has recommended that pediatricians assist their patients in this transition and transfer process.<sup>6-8</sup> Inadequate transition planning and health care coordination can lead to increasing morbidity and mortality.<sup>9,10</sup> A national survey of YSHCN and their families found that only 24% reported receiving sufficient counseling about transition.<sup>11</sup> The AAP, in cooperation with other professional societies, has twice published guidelines calling for improved transition services.<sup>6,12</sup>

Many national organizations (AAP, Center for Health Care Transition Improvement, American Heart Association) have also established practical processes to assist practices in transitioning patients.<sup>6,13-15</sup> Steps include writing a practice transition policy statement and patient transition plans, which would include addressing issues such as confidentiality.<sup>16</sup> Ultimately, these protocols include identifying and transferring pediatric patients to an adult provider. These structured processes for engaging youth and families in transition may be most successful when implemented within a medical home with available care coordination. Despite the guidelines and processes, it remains unclear how much practices are achieving these goals or can implement higher degrees of care coordination with existing resources.

Electronic Health Records (EHR) may also facilitate care transitions.<sup>17,18</sup> In 2009, the Centers for Medicare and Medicaid Services (CMS) established a set of core measures for EHR's, known as Meaningful Use (MU), that created a benchmark for the effective integration of EHRs into medical practice.<sup>19</sup> Through MU implementation, EHR's should be better able to promote coordinated, safe, efficient care. The Medicare Access and CHIP Reauthorization Act

of 2015 (MACRA) was legislated to move MUEHR beyond the implementation of technology in practices and move towards provider payments that focus more on the quality of care delivered, with EHR utilization being one aspect of high quality care.<sup>20</sup> Although MUEHR is being phased out in its purest form, provider experience with MUEHR provides an opportunity to investigate how it impacts patient care. While EHRs have been used for other forms of medical transition, such as hospital to home and between facilities, few studies have been performed to look at the impact of the EHR on the transition from pediatric to adult health care. This type of transition is unique as pediatric to adult health care transition requires more longitudinal planning, case management, and developmental considerations.<sup>21,22</sup> Given the potential for improving communication between providers, health screening and clinical care delivery, the EHR has the potential of systematically improving transition planning and care delivery for patients.

Drawing on a national survey of primary care pediatricians from the Periodic Survey of Fellows, this study examines how transition processes for YSHCN are shaped by the resources that pediatricians have available to transition patients. In particular, we investigate if practice-based care coordination and implementation of a comprehensive EHR are positively associated with recommended transition procedures such as written health care transition plans. Exploring the impact of care coordination and comprehensive electronic health records provides insight into the issues that should be the focus of advocacy for future requirements and for practice change.

## **Methods**

This analysis used data from the Periodic Survey of Fellows (PS), a nationally representative survey of randomly selected, non-retired U.S. members of the AAP. Survey

PS#79 (2012) was sent to 1,631 post-residency members. Seven mailed contacts were made from September 2011 to February 2012 to nonrespondents (in addition to two emails with a link to complete the survey electronically). The final survey response rate was 59.4%. The content of survey questions was guided by members of the National Center for Medical Home Implementation Project Advisory Committee and the AAP Council on Children with Disabilities. The purpose of this particular PS was to investigate practice resources, EHR capacity and various other practice domains on caring for pediatric patients in practice. The full contents of the survey are available from the AAP.<sup>23</sup> The survey was approved by the AAP's Institutional Review Board.

There was no specific definition of or question asking whether participants had a MUEHR in practice in the survey. Rather, participants were asked whether they use the EHR for specific clinical activities (e.g. ordering, reviewing labs, and communicating with patients). We then created a measure called "comprehensive EHR (CEHR)" for practices that indicated they had components of a MUEHR.<sup>19</sup>

#### *Primary Outcome Variables*

The question being studied was the impact of care coordination and CEHR on practice transition processes. The outcome variables addressed in this paper are if a pediatrician's practice had the following transition process measures for YSHCN: writing a transition plan, assisting in identifying adult providers for transition to adult care, and discussing consent/confidentiality issues. These were dichotomized to these services being provided in two ways. The first, as our primary reporting measure, we dichotomized these variables as "all/most YSHCN" vs. "some/none/unsure" (1=all/most YSHCN, 0=otherwise) in order to evaluate whether or not practices had a high level of transition quality of care. As a secondary measure,



in order to see whether any transition measure was done in practice more broadly, we also dichotomized these variables as “all/most/some YSHCN” vs. “none/unsure” (1=all/most/some YSHCN, 0=otherwise). The primary outcome variable for the regression model was having a written transition plan for all/most YSHCN. We chose to focus on having a written transition plan as the outcome for the logistic regression model because this is a recommended transition service and measurable outcome for practice based quality improvement activities. Finally, we report whether or not providers reported having a written transition policy in their practice.

#### *Independent variables*

Pediatrician personal characteristics included age in years, gender, and race (white vs. all other). Practice level variables included practice setting (urban non-inner city, urban inner city, suburban, rural), practice type (solo/2-physician, pediatric group/multispecialty group/Health Maintenance Organization (HMO), hospital/clinic/medical school/nonprofit community health center (CHC) /other), and percent of patients with public health insurance.

Pediatricians' practices were noted to have a comprehensive EHR if the respondents indicated they performed prescription ordering, patient/family access to medical records, clinical notes that include medical history and follow-up notes, and patients' prescribed medication list – all exclusively by EHR. Any missing value for the subcomponents for each EHR item was considered “no”.

Care coordination was measured through the question “Is there a person or team in your practice with specific responsibility for: a) care coordination (yes vs. no/unsure); and/or, b) coordinating transition planning for adolescents with special health care needs (yes vs. no/unsure).” We then developed a measure of having someone assigned for general care coordination, transition coordination, both general and transition coordination, or no

coordination at all. “Any coordination” was a measure of having said yes to either transition planning or general care coordination versus having no care coordination. The question “Who provides the majority of care coordination (i.e., the “hands-on” work) for your patients (self/other provider/nurse/social worker/care coordinator/other)?” allowed us to describe in detail who provides care coordination and whether or not pediatricians themselves provide the case management. The independent variables were chosen to adjust for additional patient, provider, and practice level factors that would likely confound transition-related activities, along with investigating the association of care coordination and EHR status on having a written transition plan.<sup>16</sup>

#### *Analysis plan*

Descriptive statistics were performed on demographic and transition elements for youth with special health care needs. Bivariate analyses were performed to study whether or not elements of transition were performed with or without a care coordinator or a transition coordinator. We also investigated whether transition outcomes varied by if there was an EHR or CEHR utilized in the physician practice. Chi square tests, Fisher’s exact test, or bivariate logistic regression were used for all bivariate analyses (as appropriate). Finally, we performed logistic regression on the outcome of having a written transition plan for all or most YSHCN. In our original model building, we tested key independent variables of MUEHR, type of care coordination available in practice, along with physician age, practice type, community setting, and percentage of patients covered by public health insurance in bivariate analyses. For purposes of item reduction in the final regression model and to address sample size constraints, we limited our outcome variables to those that were statistically significant or factors that we

thought may be key to plan outcome. Our final model included CEHR and type of care coordination, as they were significant in the bivariate analyses, and we kept practice type as we had hypothesized that smaller practices may be less likely to perform transition planning. STATA 12 (StataCorp. version 12. College Station, TX: StataCorp LP) was used for all statistical analyses.

## Results

A total of 957/1631 surveys were received for a response rate of 59.4%. To assess possible nonresponse bias, the respondents were compared with the target sample on the variables available from the AAP membership file: age, gender and region of the U.S. Respondents did not differ from the target sample regarding gender or region of the U.S.; however, respondents were slightly older than the AAP post-residency membership (47.9 vs. 46.7,  $p < 0.001$ ). Analyses for this paper were limited to 572 respondents who provided primary care (i.e., well child/preventive care) in an office- or clinic-based ambulatory care setting.

### *Physician and Practice Characteristics*

Table 1 describes the physician and practice characteristics of primary care office-based respondents used in the analysis. Our sample contained a heterogeneous group of pediatricians, representing a broad range of practice types, practice locations and diversity within their patient populations (Table 1). On average, respondents thought that transition planning should begin at the age of 18 years of age for YSHCN. While almost half of the pediatricians reported their practice had basic EHR, only 16% of practices had CEHR. Less than half of the pediatricians reported assigning an individual to perform care coordination in their practice, with 15% having someone dedicated to both general care coordination and transition coordination in their practice.

When pediatricians were asked who provided the majority of care coordination in their practice (results not shown but available upon request), 71% of pediatricians cited themselves, 15% cited a nurse, 7% cited a care coordinator and the remaining 7% were other (social work, physician assistant, other staff).

#### *Practice Transition Processes*

Table 2 summarizes pediatricians' responses on transition process measures in their practices. Only 22% of pediatricians say their practice has a written policy describing the practice's approach to transition. Just 14% of pediatricians report their practice generated a written transition plan for YSHCN most/all of the time, and 56% pediatricians say their practices did not provide any written transition plan for YSHCN. Only a small proportion of pediatricians report that their practices provided transition coordination for YSHCN. Despite only a minority of practices having someone to assist with transition coordination, almost 80% of pediatricians report they assist YSHCN in identifying an adult primary or subspecialty provider to which transfer at least some of the time, but only half perform this task all/most of the time. Less than half of pediatricians discussed confidentiality issues with YSHCN all or most of the time.

#### *Transition Processes by Care Coordination and EHR Type*

We stratified whether or not a pediatrician's practice develops a written transition plan, assists in finding a new adult provider, or discusses confidentiality issues in YSHCN special health care needs by the type of coordination provided in the practice (Table 3) and by whether or not a CEHR was used in the practice (Table 4). In general, having someone or a team assigned to care coordination increased the likelihood of practices writing transition plans, finding adult providers, and discussing confidentiality. Having any care coordinator significantly improved all metrics as compared to having no care coordinator. Most notably, in

bivariate analyses, having any transition coordinator, as compared to only having general care coordination was significantly related to higher odds of having a transition plan ( $p < 0.001$ ) and identifying an adult provider ( $p = .005$ ). There was no statistically significant difference between confidentiality rates between having a general care coordinator or having any transition coordinator. Pediatricians with CEHR also reported slightly increased rates in these metrics compared to those without CEHR.

#### *Developing Written Transition Plans*

We performed a logistic regression model to identify predictors associated with having a written transition plan for all/most adolescents with special health care needs (Table 5). Having a transition coordinator and general care coordinator in practice as well as having a comprehensive EHR was both statistically associated with increased odds of having a written transition care plan for the majority of YSHCN in their practice. In particular, having care coordination (AOR 11.1, 95% CI 5.9-21.3) and CEHR (AOR 2.6, 95% CI 1.5-5.0) were independently associated with higher odds of having a written transition plan

#### **Discussion**

Since the joint policy statement on transition in 2002, there have been many efforts to improve the continuity of care from pediatrics to adult care.<sup>12,15,24,25</sup> An updated joint policy statement in 2011 presented a protocol for practices to address transition, including items such as the development of practice transition policy statements.<sup>6</sup> The results from the AAP Periodic Survey of Fellows #79 provides data on current implementation of transition planning, identifies potential barriers, and assesses whether they have systems and resources in place to follow through on the recommendations of the transition policy statements. In particular, it highlights the role that care coordination and EHR can play in transition.

Pediatricians are addressing some issues that are specific to their young adult patients and assisting in the transfer of care, such as identifying adult providers and discussing consent and confidentiality issues (Table 2). The reported timing of these processes by our respondents seem late in context to current guidelines, where most consensus statements recommend starting the transition planning process at least by age 12-14.<sup>6,26</sup> Pediatricians in this study reported the transition process should start at 18, with a range as high as 30. It is possible that the providers answering the question misinterpreted the question as referring to when the transfer of care to an adult provider should occur rather than when planning should begin.

Pediatricians seem to be well suited to assist their patients in transferring care to an adult provider, with the majority reporting that they are assisting patients in finding an adult provider. However, variability exists in the preparation and planning for this eventual transfer, such as developing written transition plans and establishing an early age to begin these discussions. These results suggest that providers need additional training on when to begin transition planning and the components that should be included, such as writing care plans that can assist in patient self-management. Furthermore, teaching adolescents about privacy concerns is a key skill in preparing for transition to adulthood. Youth should understand how disclosure of their health information can affect their relationships, whether professional, educational, or personal. The results of this survey suggest that pediatricians' current practice does not match standards for discussing confidentiality issues with their patients.

A minority of practices reported having people to assist with transition coordination as well as having a written practice transition policy. The low rate of having a written policy is consistent with other studies that have looked at this process measure.<sup>27</sup> In general, having a transition policy would suggest that the practice has a transition planning process, as opposed to

simply transferring a patient at a given age.<sup>6</sup> Regardless, these findings are a step in the right direction and surprisingly high given that the 2011 consensus statement was published just prior to this survey being completed. These results are also indicative of how much additional work needs to be done given that development of a transition policy statement is one of the first things a practice should do in its transitions-related work.

The survey findings also provide insight to which resources actually make a difference in assisting with transition. The results suggest that practices that have a person responsible for care coordination are more likely to have a written health care transition plan, identify adult primary and/or subspecialty physicians, and discuss consent and confidentiality issues with their patients (Table 3). Although only 1 in 5 pediatricians have assigned someone dedicated to transition coordination, results in these three aforementioned areas are even higher in these practices. The results further show that 71% of pediatricians say they personally provide the majority of care coordination, in the context that overall, only 19% of practices state having any person designated as a transition coordinator in a practice. This raises the question of the capacity of pediatricians for care coordination, and the ability of pediatricians to incorporate these coordination activities into their other clinical responsibilities. The fact that so many pediatricians are conducting transition related activities suggests that this planning may be doable for at least for some of their patients. The survey does indicate that many pediatricians are performing transition planning activities for a select number of their patients. However, it also raises the question of how much more successful practices would be if they had dedicated coordinators to assist with the process. For example, only 6.2% of practices with no care coordination had a written transition plan for YSHCN. This point is reemphasized in Table 5, where, all else equal, having someone assigned to providing both care coordination and

transition coordination increases the odds of having a written transition plan. These results suggest the importance of having a dedicated transition coordinator, yet only 1 in 5 pediatricians report having someone dedicated to transition coordination within their practice. These transition coordinators are more likely to provide the care coordination necessary for optimal transition. However, these positions and activities are currently unfunded or underfunded. The additional required cost for these positions leads to better transition process measures and suggests an improved likelihood of transition outcomes.<sup>28,29</sup>

Practices that have CEHRs are also more likely to reach these three outcomes (Table 4). Having a CEHR improves the AOR of having a written transition plan to 2.6 (Table 5). A CEHR has also been shown to help with transition, though this is incentivized by the federal government.<sup>19</sup> With the emergence of MACRA and its emphasis on improving quality, this is an opportunity for the federal government to include transition quality measures into EHR. The AAP should support policy decisions that programmatically and financially assist practices with care coordination and MACRA implementation. It is also possible that those practices with more robust EHR also have more robust general resources not captured by this survey, and that both care coordination capacity and EHR capacity are markers of other system level supports for pediatricians. This would also support creative mechanisms to support local pediatricians with resources to promote transition for all YSHCN. For example, case management by insurance companies or county health plans could ensure that all YSHCN receive transition services.

This paper includes several limitations. The main focus of the survey is on process measures, such as the existence of a practice transition policy statement. Future studies should investigate if implementation leads to improved transition outcomes (e.g. decreased morbidity, lower emergency department use). It is also possible that the participants may have



misinterpreted some questions. The designation of the care coordinator does not distinguish between whether that person was a physician, nurse or other staff member, though the majority of practices who state they have care coordination, state the physician is often the primary care coordinator. Additionally, the data is cross-sectional and further limited by self-report. Finally, since this is a survey of AAP Fellows and the data was limited to primary care providers, it cannot be generalized to nonmembers and subspecialists.

### **Conclusions**

This study provides the best current status of pediatricians' readiness for transition for YSHCN. While still falling short of the recommended transition planning metrics, pediatricians are providing counseling regarding consent to adolescents and transfer to adult providers suggesting that progress has been made since the first transition consensus statement. This study also demonstrates the degree to which systems, such as care coordination and EHR, can facilitate transition processes. Furthermore, this study suggests that policy decisions which programmatically and financially assist practices with care coordination and MACRA implementation should be advocated to improve the transition of YSHCN to adult-centered care.

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Table 1: Physician and Practice Characteristics (n=572)	
<b>Physician characteristics</b>	
Age, mean (SD) n=564	47.4 (10.7)
Gender (% female) n=566	60.6%
At what age do you think transition planning from pediatric to adult health care should begin for adolescents <b>with</b> special health care needs? n=552	Mean 18.3 (SD 3.3) Range (0-30)
<b>Practice characteristics</b>	
<i>Percent of Patients with public health insurance % (% based on non-missing values)</i>	
n=572 (non-missing n=473)	
0%	11.0 % (13.5)
1-20%	22.7 % (26.7)
21-40%	17.8 % (21.8)
41-69%	12.9 % (15.8)
70% - 100%	18.2 % (22.2)
missing	17.3%
<i>Practice location</i>	
n=561	
Urban non-inner city	14.4%
Urban inner city	20.0%
Suburban	49.6%
Rural	16.0%
<i>Practice type</i>	
n = 552	
Solo/2-physician practice	15.8%
Group practice/Multispecialty practice/HMO	65.2%
Hospital/Clinic/Medical School/Non-profit community health center/other	19.0%
<i>Care Coordination (for all adolescents)</i>	
Is there a person or team in your practice with specific responsibility for care coordination (% yes)	44.4%
<i>Coordinator types (for all adolescents)</i>	
n=565	
No one assigned to care coordinator or transition coordinator	52.4%
Transition coordination only	3.4%
Care coordination only	28.9%
Has both transition and care coordination assigned to patient	15.4%
<i>Electronic Medical Records</i>	
n=572	
Basic EHR <sup>a</sup>	47.2%
Meaningful Use EHR <sup>b</sup>	15.7%

Table 2: Practice Transition Process Measures Reported by Pediatricians for Youth with Special Health Care Needs	
Question	Percentage
<i>Transition Coordination</i>	
Is there a person or team in your practice with specific responsibility for coordinating transition planning for adolescents with special health care needs (% yes)n=562	18.9%
<i>Practice Written Transition Policy</i>	
Does your practice have a written policy that describes the practice's approach to health care transition, including the age and process at which youth shift to an adult model of care? (% yes) n=564	21.5%
<i>Written Transition Plans</i>	
Written health care transition plans are developed for adolescents with special health care needs (all/most) n=560	14%
<i>Identifying Adult Providers</i>	
Adolescents with special health care needs are assisted in identifying primary and/or specialty physicians for transition to adult care (all/most/some) n=561	49%
<i>Discussing Consent and Confidentiality</i>	
Consent and confidentiality issues are discussed with adolescents with special health care needs prior to age 18 (all/most/some) n=559	41%

Table 3: Transition Process Measures by Type of Coordinator	No care coordination n=296	Both care coordinator and transition coordinator n=87	Care coordinator only n=163	Transition coordinator only n=19	Any Coordination n=269
<i>Written Transition Plans</i>					
Written health care transition plans are developed for adolescents with special health care needs (all/most) %	6.2	42.5*	12.6*	22.2*	23.1**
<i>Identifying Adult Providers</i>					
Adolescents with special health care needs are assisted in identifying primary and/or specialty physicians for transition to adult care (all/most) %	38.8	70.1*	52.2*	66.7*	59.0**
<i>Discussing Consent and Confidentiality</i>					
Consent and confidentiality issues are discussed with adolescents with special health care needs prior to age 18 (all/most) %	33.2	63.2	45.3*	27.8*	50.0**
<p>* p&lt;.05 via bivariate logistic regression with no care coordination as comparison group for each care coordination element listed except “any care coordination” which is a composite of all care coordination types listed.</p> <p>** p&lt;.001 Comparison between any care coordination and no care coordination performed by chi square.</p>					

Table 4: Transition Process Measures by Type of EHR	With CEHR <sup>a</sup> n=89	Without CEHR n=473
<i>Written Transition Plans</i>		
Written health care transition plans are developed for adolescents with special health care needs (all/most)	23.6%	12.3%*
<i>Identifying Adult Providers</i>		
Adolescents with special health care needs are assisted in identifying primary and/or specialty physicians for transition to adult care (all/most)	49.4%	48.5%
<i>Discussing Consent and Confidentiality</i>		
Consent and confidentiality issues are discussed with adolescents with special health care needs prior to age 18 (all/most)	50.6%	39.2%*
<sup>a</sup> CEHR: Ordering, medical records to family, medication use and clinical notes *p<0.05 by chi-square test comparing 'with CEHR' to 'without CEHR'		

Table 5 Logistic Model of Having a Written Transition Plan for all/most YSHCN	Unadjusted (CI)	Adjusted Odds Ratio (CI)* n=540
<i>Care coordinator</i>		
None	Ref	Ref
Transition coordinator only	4.4 (1.3, 14.6)	4.1 (1.2, 14.1)
Care coordinator only	2.2 (1.1, 4.3)	2.0 (1.0, 4.0)
Both care coordinator and transition coordinator	11.3 (5.9, 21.3)	11.1 (5.7, 21.7)
<i>Setting</i>		
1-2 person practice	ref	ref
Group practice/HMO	0.5 (0.3, 1.0)	0.9 (0.4, 2.0)
Med school/hospital/CHC	0.8 (0.4, 1.7)	1.2 (0.6, 3.9)
<i>Has Comprehensive EHR</i>	2.2 (1.3, 3.9)	2.6 (1.4, 5.0)