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Medical Student Exposure to Components of the Patient Centered Medical Home During Required Ambulatory Clerkship Rotations: Implications for Education

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Abstract

Purpose—To determine the extent to which third year medical students are exposed to elements of the patient-centered medical home (PCMH) during required family medicine clerkships and how this exposure varies among a sample of medical schools.

Method—In 2008, the authors conducted a cross-sectional survey of 104 ambulatory teaching practices that host required third-year family medicine clerkship students from 9 American medical schools. Descriptive statistics characterized learning settings and the status of PCMH features, and generalized linear mixed models were used to examine variation between medical schools, as the 104 clinics were nested within nine medical schools.

Results—Participating schools captured data on 55.3% of eligible clerkship sites. These practices were primarily community-based single specialty clinics (46.5%), and more than half were part of

an integrated health system. Electronic health records (EHR) were in place in 58% and there was no significant difference in EHR use according to medical school, despite up to a 10-fold variation from school to school in other PCMH features. Among sites with EHR, 12.1% did not allow access to medical students. Attitudes about how practice transformation and new information technology are affecting the quality of medical education differ widely from site to site.

Conclusions—Primary care transformation toward the PCMH is already well underway in a national sample of family medicine teaching sites and this is having important effects on medical student education.

A national debate is now underway regarding how to reform America's health care system. Central to this debate is the need to transform both the financing of healthcare and the way in which it is delivered. Nowhere is the need for delivery system reform more evident than in ambulatory primary care practice. Thus, the concept of Patient-centered Medical Homes (PCMH) has emerged as a keystone in the reform process, based primarily on evidence compiled by Starfield and others on primary care's favorable population health effects and lower health care costs (1-6).

Introduction

A PCMH can be defined as a transformed model of delivering basic health services to populations of people that bring together four key concepts: the well-established benefits of primary care, an improved model to care for chronic illnesses, an increased focus on the patient as consumer, and an increased use of communication and information technology (7-14). Specific features of this model include that: 1) Each patient has an ongoing relationship with a personal physician trained to provide first contact, continuous and comprehensive care; 2) Care is provided by physician-led teams; 3) Care teams provide or arrange care through all stages of life; 4) Care is coordinated across all elements of the health care system and community; 5) Care is facilitated by disease registries and information technology; 6) Enhanced access is available through expanded hours and advanced-access scheduling; 7) Quality and safety are ensured through the use of continuous quality improvement, evidence-based medicine and clinical decision-support tools with active patient participation and feedback, and; 8) the payment system is reformed to recognize the added value provided to PCMH patients (12). A national demonstration project has already been conducted in how this model might be adopted in community-based primary care practices and other similar projects are being planned (7).

What has been missing from the debate about health care reform is a discussion of the implications of such reform on undergraduate and graduate medical education. While important work is either underway or beginning on the redesign of residency education in primary care, including family medicine (15,16), general pediatrics (17) and general internal medicine (18), there is a paucity of educational research on assessment of and exposure to PCMH features in the 3rd year core clerkship curriculum in U.S. medical schools and how this may vary among medical schools. Undoubtedly, medical students should learn to use information technology and other features of practice that are likely to become part of residency training, and graduating residents need to move smoothly into contemporary clinical practice. Without knowing the status of evolving new elements of practice, medical educators can only speculate about what must be taught, how it can be taught, and what will best prepare graduating physicians for their clinical work.

We conducted a cross-sectional study to examine the extent to which ambulatory family medicine clerkship sites are implementing features of the PCMH. Physicians in 104 family medicine teaching practices associated with nine medical schools completed a self-

administered survey to indicate how these features are being implemented and the extent to which implementation varied according to medical school.

METHODS

Study Participants

To identify participating medical schools, we posted a message calling for volunteers on a list-serve for family medicine pre-doctoral clerkship directors. To be eligible for the study at the medical school level, participating schools were required to have a well-established third-year family medicine clerkship mandatory for all students and to have a curriculum that assigned these students to ambulatory clinical practices as part of the clerkship. In addition, we sought schools that were representative of the nation in terms of geography and size. The *Society of Teachers of Family Medicine (STFM)* and the STFM Research Committee assisted in the recruitment of participating institutions. This process identified 13 medical schools that indicated initial interest. A family medicine pre-doctoral faculty leader in each of these 13 schools received a letter detailing study procedures and was asked to complete one study form that ascertained information typically collected about all active clerkship sites. After receiving this information, twelve of the 13 schools (92.3%) agreed to participate in the study, and we were able to ascertain the number of eligible clinic sites involved in clerkship training at each school.

We asked a family medicine pre-doctoral faculty leader at each participating school to identify a local study coordinator who would administer and collect study measures. This coordinator received a packet of practice surveys and was asked to provide these to each clerkship site identified by their medical school as meeting eligibility criteria and to collect the completed documents. To be eligible for the study, a clerkship site must have hosted at least one clerkship student per year for each of the previous three academic years. The participating medical school family medicine department received \$700 for completing the project. The Institutional Review Board at Oregon Health & Science University approved the study.

Survey Instrument Development and Testing

We developed two study instruments. The first was a Pre-doctoral Leader Survey to be completed by a family medicine pre-doctoral faculty leader at each participating school. This instrument was designed to identify the clerkship sites affiliated with each institution including: 1) the total number of eligible practice sites at that school and; 2) the total number of practices that completed the PCMH practice survey as described below. This pre-doctoral leader survey was developed and tested using cognitive interviews with pre-doctoral faculty members at a non-participating school and we revised the instrument based on feedback about the clarity of questions and the accuracy of information collected.

The second instrument was a PCMH Practice Survey, which we designed to be self-administered by the lead physician at each eligible clerkship site. The PCMH Practice Survey had three parts; the first described features of the practice as a learning setting (e.g., status as a federally-qualified health center, type of practice, and whether residents are also trained at the site). The second part of the survey assessed electronic and non-electronic aspects of the PCMH (e.g., electronic health records, asynchronous electronic communication with patients and other clinicians, group visits, advanced access scheduling, and use of disease registries). The third part assessed attitudes about electronic record systems and their impact on medical education. We adapted this instrument from previous studies of community family medicine practices (7) and family medicine residencies (16) and extensively pilot tested it at three family medicine clerkship practice sites that were not involved in the current study. In these early testing phases, we used cognitive interview techniques to ensure that respondents understood

the questions as intended by the survey design. The possible responses for the presence of each component of the PCMH were 1=absent (no plans to implement in the future), 2=planning (active planning underway but not implemented), 3=present but not mature (revisions planned), and 4=mature (no planned changes in the near future).

Data Collection

Data collection for the study began in August 2008 and was completed in November of the same year. The designated family medicine pre-doctoral leader at each participating medical school completed the pre-doctoral leader survey. The PCMH Practice Survey was distributed to each school's eligible clerkship sites by the local study coordinator at each medical school. Completed surveys were collected by the local study coordinator and returned to the project team at Oregon Health and Science University. Study staff worked with contacts at each medical school to encourage data collection and return of completed instruments and contacted individual practice sites regarding incomplete surveys or suspected data errors.

Data Management and Statistical Analyses

Submitted surveys were double entered with a third review and correction, using source documents if agreement between the two data entry staff members was incongruent. We ran frequencies to identify outliers, and called study sites to either correct or confirm the accuracy of data that might have been incorrect. At least two study staff members reviewed and initialed all resulting changes to source documents.

We created analytic files to examine characteristics of the practices and the status of PCMH features and we used descriptive statistics to characterize the practices and their overall adoption of features of the PCMH. We used general linear mixed models to account for covariance due to nesting of clinics according to medical school. For purposes of this analysis we collapsed absent and planning into one category called "absent" and present and mature into a second category called "present." We examined electronic and non-electronic features of the PCMH separately. For another analysis we created composite variables that were a sum of all PCMH features (electronic and non-electronic, separately). We used Pearson's correlation coefficient to assess the relationships between the composite scores and patient volume. And we additionally explored relationships between the composite scores and practice setting features, such as being an integrated health system or a federally qualified health. We set alpha at 0.05 or less to assess for statistical differences, and all tests were two-tailed.

RESULTS

Nine of the 12 medical schools (75.0%) that agreed to participate completed the majority of study activities (Albert Einstein College of Medicine (NY), Jefferson Medical College (PA), New Jersey Medical School (NJ), Medical University of South Carolina (SC), Southern Illinois University School of Medicine (IL), Eastern Virginia Medical School (VA), University of North Dakota School of Medicine & Health Sciences (ND), University of Texas, San Antonio School of Medicine (TX), and University of Washington School of Medicine (WA)). Three schools withdrew from the study because of difficulty obtaining completed surveys from their clerkship sites. Overall, participating schools captured data on 55.3% of eligible family medicine clerkship sites, with a range of 18-100% (Table 1). Table 2 lists descriptive information about these practices. They were primarily community-based single specialty clinics (46.5%), and more than half were part of an integrated health system. Twenty percent were federally qualified health centers. The vast majority of the practices assign a personal physician to each patient (>95%), and the clinics had substantial differences in the number of patients seen annually (mean = 25,436; SD=35,497, range 1,000-216,000).

Status of all electronic features of the PCMH aggregated for all medical schools (Figure 1) indicate that 58% of clinics have electronic health records (EHR) in place and in nearly 37% they are mature. Other electronic elements are less likely to be mature. Use of EHR for chronic disease and preventive registries are most likely to be in the planning stages, and conducting practice-based research using the EHR and a having functional quality telephone monitoring system are most likely to not have active plans for implementation. Status of non-electronic features of the PCMH aggregated for all medical schools (Figure 2) indicate adequate free parking and having convenient access to public transportation are the most present and mature aspects of the PCMH and that group visits and integrated case management and social services are most likely to be absent features.

Our general linear mixed model analyses are presented in Tables 3-5. Of the 14 electronic features assessed (Table 3), none had statistically significant differences according to medical school, even though there was up to 10 fold variation in implementation of other PCMH features. Three PCMH electronic features reached 50% implementation when averaged according to medical school. These included: 1) presence of an electronic health record (EHR), which ranged from 33% to 100%; 2) having fully secured remote access available (range 33.3-100%; and 3) electronic scheduling system integrated into EHR (22-100%).

Implementation of non-electronic features of the patient-centered medical home (Table 4) indicates that of the 12 features assessed, three (25%) were found to vary significantly among schools. These included: 1) having a credible, reliable patient satisfaction survey (range 20-100%; $p=0.02$); 2) having clinical pharmacy support in place (range 13-100%; $p=0.05$); and 3) having adequate free parking (range 6.7-100%, $p=0.007$). There was no significant difference in the other non-electronic elements of the PCMH. We did find that seven of the 12 features assessed (58.3%) had been implemented in more than half of clerkship sites according to medical school. These included: 1) expanded hours (range 48-100%); 2) credible, reliable patient satisfaction survey (range 20-100%); 3) integrated behavioral health (range 13-100%); 4) adequate physical space (range 60-100%); 5) adequate free parking (range 6.7-100%); 6) convenient public transportation available (range 55.6-100%); and 7) overall status of practice as patient-centered versus physician centered (range 33.3-100%).

Table 5 outlines our findings related to attitudes about how new technology in clinical practice influences medical education. Approximately 88% (87.9%) of clinics that have EHR allow medical students to access their EHR, while 12.1% do not. We found wide variation among the practices in attitudes about how new technologies affect the quality of medical education and about students playing a larger role in the patient care team as a result of new technology, though this variation was not significantly different among the medical schools.

We examined several factors that we thought might be associated with high versus low PCMH component implementation to determine the best analytic approach using our composite scores. These included being a FQHC or integrated health system. We found no associations with type of practice setting for either of these variables. We also examined the relationship between patient volume and electronic features of the PCMH to test the hypothesis that high patient volume might be correlated with more electronic and non-electronic features of the PCMH (using the composite scores). The correlation coefficient between these two variables was 0.48 ($p=0.66$) for electronic features and -0.04 ($p=0.71$) for non-electronic features, indicating no significant relationship between patient volume and features of the PCMH.

CONCLUSIONS

Health care reform is likely to generate a period of rapid change in how medicine is practiced throughout the United States and these changes are already having a significant impact on the

day-to-day work of physicians ^{7,14,16,19,20}). Educating medical students while in this transitional mode raises questions about curricular objectives and how best to prepare students for careers in a new model of practice.

To our knowledge, our study is the first to use a national sample to examine the degree to which American medical students are experiencing elements of the PCMH in their required curriculum as well as the extent to which exposure to PCMH features varies by medical school. Since third-year internal medicine and pediatric clerkships are often based primarily in hospital settings, family medicine clerkships are the most likely place in the curriculum for students to first experience these new care models in the ambulatory setting. While we found up to 10-fold differences from school to school in our analysis of clerkship training sites; only three areas reached statistically significant variation and all three were in non-electronic features. We found that over 50% of clerkship placement sites have electronic health records, which differs from the findings of Linder et al (21) who found that in 2003 and 2004 only 18% of patients seen as recorded on the Ambulatory Medical Care Survey were seen using EHRs. Our findings suggest that implementation of these features may be rapidly expanding or that medical school faculty may be selectively assigning students to practices with more of these features. While other reports that have shown wide variation among clinical practices in how and when elements of this new model of care arise (7,19), they did not focus on the teaching that occurs in these settings, which is the specific contribution to the literature that our study makes.

We explored several possible sources of variation including whether the practices were part of integrated health systems or federally qualified health centers or whether high patient volume was associated with more versus less PCMH features. We found no such association, which leaves us to speculate about other possible explanations. It may be that some regions of the country are implementing the PCMH model more readily than others or that practice size and other features simply do not matter when innovations likely to improve patient care appear. There also might be varying degrees of attention paid to these factors when medical school clerkship faculty members select training sites.

We were surprised to learn how much variability there is regarding preceptor attitudes about the effects of practice transformation and information technology on medical education, even though these variables did not reach statistical significance when analyzed by medical school. There appeared to be no overall consensus on whether emerging technologies in the care of patients will help or hinder student education. In three of the nine schools, over 65% of preceptors either agreed or strongly agreed that new technology would improve medical education, while at another six schools more than half of respondents disagreed or strongly disagreed that new technology would improve the quality of medical education. Previous work suggests that there is considerable disagreement on this point among medical students, residents, and medical educators (22-25). In one paper (22), Peled and colleagues speculate that use of EHRs bypass the need for trainees to synthesize clinical information because so much of this is done for them. They also note that EHRs can be a significant distraction for learners as they focus too heavily on the computer and not enough on patients. However another study (23) done of 3rd year medical students found that preceptors gave more and better feedback on progress notes when they are entered into an EHR.

Our responses on the influence of electronic technology on medical education may be due to factors identified in the papers cited above or they may be due to timing of our survey compared to when the electronic health record (EHR) use started in each practice. Our survey was done at a point in time where many practices were newly starting their EHR (only 36.9% described their EHR as mature). In the initial years that an EHR is started in a practice, physicians are stressed by transforming their practice from paper to electronic (19) and there may be an initial

perception that EHR creates barriers to patient care and time management. Physicians working during such times of transition may have a hard time seeing the benefits of the EHR for patient care, let alone be able to fathom the benefits to medical education. This is understandable in light of published research questioning whether EHR's improve ambulatory care (21) or reduce cost (26) at this point in their evolution. Students working in these practices are often experiencing an environment of chaotic change, and this is likely to affect their education in unpredictable ways. Stressed physicians are likely to be less effective teachers.

Preceptors also may not know how to best use new technology when teaching. A lack of faculty development in the area of using electronic media for medical education may leave these preceptors at a loss when confronted with the daily demands of both patients and students. Preceptors not only need instruction in using the technology clinically, but also in how to use the technology educationally.

If a student does not have access to the EHR, it is hard to imagine how they could review patients' history, identify and interpret lab results, write notes, or investigate consultant reports, all essential task for clinical education to occur. In 12.1% of the EHR equipped practices in our study, students did not have access to using the record system. Using EHR in education requires a change in the systems of teaching and the infrastructure for this education needs support. Excellent medical education using an EHR requires that students have a place to use the computer, a computer to use, a password to get into the system, adequate practice with the EHR system, permission to enter orders and write notes in the chart, and an understanding of the power of the EHR in quality chronic disease and population management.

We found more variability in the adoption of non-electronic features of the medical home. These included having a credible, reliable patient satisfaction survey; having clinical pharmacy support in place, and having adequate free parking. Reasons for the variation found for these items may indicate being in metropolitan versus suburban or rural settings and may indicate the status of the health systems to which some of these practices belong. For the PCMH to be embraced by patients, this new model of care must be more immediately accessible and more user friendly to consumers. It has been argued that such patient-centeredness is the most essential concept in the PCMH (8,20). Many of the attributes of patient-centeredness model key components of professionalism for students, helping them to learn how to be available to patients while managing appropriate boundaries between personal and professional responsibilities. It is not clear how much attention medical school faculty are paying to the principles of the PCMH when choosing practices in which to place clerkship students, but differences in this emphasis may also explain some of the variation we found from school to school.

The strength of our study is that we were able to collect detailed information about features of the PCMH from over 100 clinics that are active ambulatory care teaching sites for 3rd year medical students. The limitations include that only nine medical schools were represented, which though it represents a national sample, is not generalizable to all sites where such medical student education occurs. In addition, though we attempted to control who completed the survey at each site, we are not confident that the lead physician was always the one who performed this task, so response bias may have influenced our findings. We chose to focus our analysis on established clerkship training sites with a clear history of taking students over time. While this choice allowed us to survey those sites that take the most students, we did not include new or part-time sites and this might have influenced our results.

We surveyed the practices and not the students because our primary interest was in how these teaching practices were changing and we sought to compare our results to similar analyses in previous studies at the residency and community practice levels (7,16). An obvious follow-up

approach might be to measure student experiences and attitudes before and after completing required clerkships in these practices.

In conclusion, we found the process of primary care transformation toward the Patient-centered Medical Home is already well underway in a national sample of family medicine clerkship sites. There was modest variability in specific features of the PCMH according to medical school and considerable variation in preceptor attitudes about the impact of new technologies on ambulatory medical education. How to manage this variability will be a major challenge to family medicine clerkship and medical school curricular leaders for the next several years.

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Figure 1.
Status of Electronic Features of the Patient Centered Medical Home (n=104)

Figure 2.
Status in Percent of Non-electronic Features of the Patient Centered Medical Home

Table 1Extent of Representation of Eligible[†] Clerkship Sites According to Participating Medical School

Medical School [*]	Number of Eligible Practices Hosting FM Clerkship Students	Number of Practices that Completed PCMH Survey	Percent of Eligible Practices that Completed PCMH Survey
A	20	15	75%
B	6	6	100%
C	32	15	47%
D	50	9	18%
E	16	9	56%
F	28	6	21%
G	22	11	50%
H	46	28	61%
I	19	5	26%
Total	239	104	44%
Mean (Range)	26.6 (6-50)	11.6 (5-28)	55.3% (18%-100%)

[†] In past 3 years^{*} schools placed in random order

Table 2

Characteristics of the Teaching Practices Included in the Analyses (n=104*)

Characteristics	% Clerkship Sites Overall	Average % at Schools	Range for School
Learning Setting			
Academic ambulatory clinic located at medical center	9.9%	15.6%	3.6 - 33.3%
Academic ambulatory satellite clinic	10.9%	18.7%	11.1 - 28.6%
Community-based single specialty clinic	46.5%	44.6%	33.3 – 57.1%
Community-based multi-specialty office	27.7%	31.1%	7.1 – 60.0%
Other	5%	11.7%	6.7 – 16.7%
Practice is a Federally Qualified Health Center	20.0%	35.2%	14.3-55.6%
Practice is part of an integrated health system (with specialists & hospital)	53.1%	53.2%	13.3-83.3%
All patients assigned to a personal physicians	95.2%	96.5%	86.7 – 100%
Mean % of continuity visits			
For routine care	66.8%	68.5%	56.4 - 79.9%
For acute care	34.0%	31.8%	17.6 - 43.3%
Number of patients seen on average in 2007			
Mean (Standard Deviation)	25,436 (35,497)	20,972 (33,431)	999 – 216,000
Range	1,000-216,000		
Number of days on average to the first available <i>new patient appointment</i>			
Mean (Standard Deviation)	9.2 (13.6)	9.1 (4.4)	34 – 15.1
Practice accommodates acute patients on the same day (60.6% missing response for this variable)	75.6%	88.3%	50 – 100%
Number of days on average to the first available <i>acute appointment (if not seen on the same day)</i> Mean (SD)			
(4 Medical Schools had no responding clinics)	4.3 (4.6)	4.0 (2.6)	1.5 - 8
Family medicine residents also trained at this site	34.3%	42.4%	50.0 – 85.7%
Other learners also trained at site over the past year			
Mean number of medical students (not doing family medicine clerkship) (SD)	12.6 (20.2)	16.1 (16.1)	3.4 – 56.8
Mean number of other students	3.7 (5.7)	5.4 (5.6)	1.5 – 20.0

* Missing data ranges from 2-10 per variables (2%-10%) except where noted, when data are missing the valid percent is shown

Table 3
Percent of Electronic Features of the Patient Centered Medical Home Present or Mature (versus Absent or Planning) in Family Medicine Clerkship Sites according to Medical School

PCMH Electronic Components	% Present for Clerkship Sites at Each School	Overall % Sites	Average % Sites at Schools	Range for Schools	p value ¹
EHR (Electronic Health Record) in practice		57.7	58.74	33.3-100	0.65
Practice is paperless (all interfaces and scanning work - no paper charts)		45.2	49.7	33.3-100	0.68
Fully secured remote access available		55.8	56.2	33.3-100	0.78
Electronic scheduling system integrated with EHR		55.3	52.4	22.2 - 100	0.69
Electronic billing system integrated with EHR		38.0	43.2	9.1 - 100	0.15
Electronic orders (e.g., lab, x-ray) integrated with EHR		40.6	44.8	25.0 - 100	0.83
Hospital EHR with full-computerized physician order entry in use		28.3	33.5	16.7 - 100	0.81

PCMH Electronic Components	% Present for Clerkship Sites at Each School	Overall % Sites	Average % Sites at Schools	Range for Schools	P value [†]
Secure HIPAA-compliant asynchronous communication with patients (including e-mail)		27.5	28.5	6.7 - 55.6	0.15
Asynchronous communication with other clinicians in use		46.1	39.2	16.7 - 64.3	0.16
Ongoing population-based QA using an EHR in use		33.0	32.58	0 - 100	0.82
Chronic disease management registries in use		42.2	40.8	0 - 100	0.94
EHR-based preventive services registries in use		30.9	34.6	7.1 - 100	0.38
Practice-based research done using an EHR		17.2	19.8	0 - 66.7	0.21

[†] Clinic responses for 3 schools with less than 30% clinic participation were combined for summary statistics.

Table 4

Percent of Other Features of the Patient Centered Medical Home Present or Mature (versus Absent or Planning) in Family Medicine Clerkship Sites According to Medical School

PMH Non-Electronic Components	% Present for Clerkship Sites at Each School	Overall % Sites	Average % Sites at Schools	Range for Schools	p value/
Extended hours (e.g., clinic hours after 5 p.m. on weekdays or weekend clinic hours) on-site		59.6	68.0	44.4 - 100	0.38
Functional quality monitoring system (e.g., system to monitor call volume, nonresponse or time to answer) in use		42.9	48.7	13.3 - 100	0.31
Valid, reliable patient satisfaction survey (annual or at least the practice level) in use		68.3	67.4	20.0 - 100	0.02
Advanced or open-access scheduling in place		17.8	17.1	0 - 33.3	0.54
Interdisciplinary teams to manage patient care in place		40.6	44.7	20.0 - 100	0.34

MMH Non-Electronic Components	% Present for Clerkship Sites at Each School	Overall % Sites	Average % Sites at Schools	Range for Schools	p value ¹
Integrated behavioral health in use		48.0	54.6	13.3 - 100	0.11
Integrated "case management," social services in use		38.2	36.7	0 - 100	0.52
Technical pharmacy support in place		41.6	42.3	0 - 100	0.05
Group visits in use		20.4	28.1	0 - 100	0.41
Adequate physical space available		76.7	79.2	60.0 - 100	0.53
Adequate free parking available		83.3	86.3	6.7 - 100	0.007
Convenient public transportation available		79.4	82.3	55.6 - 100	0.74
Overall status of practice as "patient-centered" versus "physician centered."		60.2	64.6	33.3 - 100	0.43

¹ p values for 3 schools with less than 30% clinic participation were combined for summary statistics.

Table 5
Attitudes About New Technology & Medical Education Among Practices With & Without an Electronic Health Record

	Medical Schools									
	A n=6	B n=3	C n=10	D n=7	E n=4	F n=2	G n=6	H n=18	I n=5	p value
Clinics with Electronic Medical Records	6	3	10	7	4	1	5	18	5	
Clinics responding to question										
Medical students have access to the Electronic Health Record	100%	67%	70%	100%	100%	0%	100%	89%	100%	0.839
Attitudes About New Technology & Medical Education	A n=12	B n=4	C n=15	D n=8	E n=6	F n=6	G n=7	H n=27	I n=5	p value
New technology in medical practice has improved the quality of medical education for students in our clinic										
% Agree	47	33	80	67	22	17	27	46	100	0.249 ¹
EHR Absent	0		75	0		0		29		0.118 ²
EHR Planning	63	33	100	100	40	33	0	100		0.164 ³
EHR Present	33	33	78	71	0	0	50	44	100	
Students are playing a larger role in the patient care team as a result of new technology (EMR, Point of Care Informatics) in our clinic										
% Agree	27	17	40	44	11	0	0	29	100	0.931 ¹
EHR Absent	0		50	0		0		14		0.977 ²
EHR Planning	25	0	100	0	0	0	0	67		0.378 ³
EHR Present	33	33	22	57	25	0	0	28	100	

¹ Differences between schools in overall agreement

² Differences between schools adjusted for EHR Stage

³ Differences in EHR Stage