Title
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Journal
Ophthalmic Plastic and Reconstructive Surgery, 36(3)

ISSN
0740-9303

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Publication Date
2020-05-01

DOI
10.1097/iop.0000000000001531

Peer reviewed

HHS Public Access
Author manuscript
Ophthalmic Plast Reconstr Surg. Author manuscript; available in PMC 2020 May 09.

Published in final edited form as:
Ophthalmic Plast Reconstr Surg. 2020 ; 36(3): 277–283. doi:10.1097/IOP.0000000000001531.

Evaluation of Electronic Health Record Implementation in an Academic Oculoplastics Practice

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Abstract

Purpose: Despite increasing electronic health record (EHR) adoption, perceptions of EHRs are negative among ophthalmologists due to concerns about productivity, costs, and documentation. The authors evaluated the effects of EHR adoption in an oculoplastics practice, which had not been previously studied.

Methods: Clinical volume, documentation time, time spent with patients, reimbursement, relative value units, and patient satisfaction were examined for 2 academic oculoplastics attendings between April 2018 and April 2019, with EHR implementation in September 2018.

Results: The mean number of patients seen in a half-day clinic was 31.8 versus 27.7 ($p = 0.018$) pre- and post-EHR implementation, respectively. EHR implementation had no effect on total monthly reimbursement ($p = 0.88$) or total monthly relative value units ($p = 0.54$). Average reimbursement ($p = 0.004$) and relative value units ($p = 0.001$) per patient encounter were significantly greater with EHR use. Patient satisfaction scores improved ($p = 0.018$). Mean physician time per patient increased from 6.4 to 9.0 minutes ($p < 0.001$). Mean documentation time per patient increased from 1.7 to 3.6 minutes ($p < 0.001$). Average patient wait times decreased by 9 minutes ($p = 0.03$) with EHR use. No scribes were used.

Conclusions: EHR implementation was associated with decreased patient volume without significant differences in total reimbursement. Although EHR adoption was associated with increased physician time devoted to patients and greater time expenditure on documentation, patients experienced decreased wait times. This suggests that EHR use streamlined the overall

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Presented at the American Society of Ophthalmic Plastic and Reconstructive Surgery 50th Anniversary 2019 Fall Scientific Symposium on October 11, 2019 in San Francisco, CA.

The authors have no conflicts of interest to disclose.

clinic flow without sacrificing physicians' time with the patient. The author's findings suggest that EHR implementation can be accomplished in an academic oculoplastics setting without negative impact on patient experience or reimbursement considerations.

The adoption rate of electronic health records (EHRs) among ophthalmologists has increased tremendously over the last decade.[1] In a national, population-based cross-sectional survey administered by the American Academy of Ophthalmology in 2016, 72.1% of respondents reported having implemented an EHR, compared with just 19% in a similar survey in 2006.[1] Despite increasing adoption, perceptions of the EHR have become more negative among ophthalmologists and among physicians in general, which has been attributed to concerns about decreased productivity, increased costs, and increased time and effort required for clinical documentation, leading to concerns that EHR use is a major risk factor for physician burnout.[2–7] However, little is known about the effects of EHR implementation specifically on oculoplastic surgeons. The American Academy of Ophthalmology survey found that a significantly greater proportion of practices with an EHR included physicians practicing oculoplastics (104/265, 40%) compared with practices without an EHR (22/65, 28%; $p < 0.001$), but survey response data regarding perceptions of clinical productivity and revenue were not reported specifically for oculoplastic surgeons.[1] Most studies examining changes with EHR implementation in ophthalmology practice settings report aggregated data for the entire ophthalmology department.[8,9] A few studies have looked at specific changes for individual ophthalmology divisions such as pediatrics,[10] retina,[10] and glaucoma.[11] Analyses of the impact of EHR implementation specifically on oculoplastics practices are lacking.

Understanding how EHR implementation affects oculoplastics practices is important given the unique features of this subspecialty. Ophthalmology practices in general pose particular demands on an EHR, such as a high patient flow, a mix of medical and surgical workflows, and the need for ancillary imaging integration.[12] In addition to these requirements, oculoplastics practices exert even greater demands on the EHR given the large variety of diagnoses and subsequent variations in workflows, the high proportion of surgical patients, the frequency of procedures performed in the clinic, and the need for laboratory testing and neuroimaging evaluation. Thus, oculoplastics practices may face unique challenges with EHR use, but strategies for addressing these challenges have not been rigorously studied.

In this study, the authors evaluated how EHR adoption affected an oculoplastics practice via detailed analyses of the following outcomes: clinical volume, reimbursement, and patient experience and satisfaction. Time utilization for oculoplastics attendings and for patients were also evaluated before and after EHR implementation. These findings may inform improvements in EHR use and provide a framework for evaluating future changes in health information technology in oculoplastics.

METHODS

Study Design.

This prospective study analyzed a single academic oculoplastics practice as it underwent a transition from using paper-based clinical documentation to using the enterprise-wide EHR with a dedicated ophthalmology module (Epic Kaleidoscope; Epic Systems, Verona, WI, U.S.A.). The study adhered to the tenets of the Declaration of Helsinki and complied with the Health Insurance Portability and Accountability Act. The UCSD Institutional Review Board/Human Research Protections Program approved the study protocol. The study spanned a year-long period from April 2018 to April 2019, with EHR implementation occurring in late September 2018.

Study Population.

Oculofacial Plastic and Reconstructive Surgery is a division of the UCSD Viterbi Family Department of Ophthalmology in La Jolla, CA. The division consists of 3 full-time oculoplastics attendings, all of whom participated in the implementation of an EHR in the outpatient clinic setting in September 2018. An EHR (OpTime, EPIC, Cadence, Verona, WI, U.S.A.) had already been implemented in the operating room suite several years prior, so surgical workflows were not included in this study. Two of the 3 oculoplastics attendings were included in the study as they were present during the entire study period. The study also included a time-motion analysis to evaluate oculoplastics attendings' time utilization as well as patient wait times. For this component, all patients with appointments in the outpatient oculoplastics clinic were eligible for inclusion.

EHR Implementation Process.

Two senior oculoplastics attendings were observed in the study. Both oculoplastics attendings underwent a 4-hour long EHR training session led by analysts with expertise in the EHR ophthalmology module. All trainees, including fellows and residents rotating in the oculoplastics attendings' clinics, attended these sessions. Technicians attended separate training sessions held by the same analysts but tailored to technician workflows. During this session, both oculoplastics attendings practiced using a "play" environment simulating real documentation and charting as they learned how to navigate and operate the EHR. Both oculoplastics attendings worked directly with the analysts to personalize their EHR accounts. Commonly used customization features included the creation of note templates that allow for rapid phrase entry into free text fields, the creation of common order lists, and the use of customized oculoplastics examination tabs for physical exam data entry. In addition, the oculoplastics attendings received in-clinic support during the EHR implementation via on-site analysts, a centralized implementation command center accessible via telephone, and institutional staff support. During the in-clinic support phase, physicians also had the opportunity to relay feedback to the analysts about technical issues regarding various EHR features and desired functionality. Support staff in clinic assisted oculoplastics attendings with modifications such as helping edit note templates, creating new order sets, and addressing any questions. Although no mobile or tablet-based EHR training occurred during formal training sessions, on-site support provided the oculoplastics attendings with assistance using mobile- and tablet-based EHR applications (Epic Haiku and Epic Canto, respectively; Epic Systems, Verona, WI, U.S.A.). A scheduling template adjustment was agreed upon in advance before implementation to reduce clinical volume to 50% of maximum capacity for 2 weeks after EHR implementation, followed by 75% of maximum capacity for 1 week to accommodate the transition from paper to EHR.

Outcome Measurements.

Data regarding demographics, years of practice, and prior EHR experience were collected. To evaluate the effects of EHR implementation on this oculoplastics practice, the following outcomes were analyzed both before and after EHR implementation: clinical volume, financial reimbursement, patient experience, and oculoplastics attendings' time expenditures in documentation and with patients.

Clinical Volume.

To measure clinical volume, clinic schedules were reviewed in the electronic registration and scheduling system from April 2018 to April 2019. A total of 4 regularly scheduled outpatient/ambulatory clinics (2 from each of the 2 oculoplastics attendings) each week were chosen to be included in analysis. Add-on clinics and dedicated procedural clinics were not included, as these were felt to not be representative of typical outpatient workflows. The number of completed encounters and the number of missed appointments were recorded for each week of the study. Additionally, clinic start and end times were recorded and used to calculate the total amount of clinic time. To calculate the average number of completed patient encounters per hour before and after EHR implementation, the total number of completed patient encounters each week was divided by the total number of clinic hours each week, and the mean of these values were calculated for all clinics before EHR implementation and after EHR implementation, excluding the 3 weeks during which clinics were deliberately downbooked.

Financial Reimbursement.

To evaluate the impact of EHR implementation on the financial aspects of the practice, monthly reimbursement, and relative value units (RVUs) during the study period were obtained from the department's financial division. Monthly reimbursement and RVUs were standardized relative to the values obtained in April 2018—whose magnitude was defined as value of 1—for purposes of reporting and comparison. Reimbursement per patient encounter was calculated by dividing the monthly magnitude of reimbursement by the number of completed patient encounters. Similarly, RVUs per patient encounter was calculated by dividing the monthly magnitude of RVUs by the number of completed patient encounters.

Patient Experience.

Patient experience was measured in 2 ways: 1) Average Press Ganey patient satisfaction survey scores in the 6 months before versus 6 months after EHR implementation and 2) patient wait times measured by manual time-motion observations, which were collected 2 weeks before and 6 weeks after implementation.

Monthly Press Ganey patient satisfaction scores (a representation of "likelihood to recommend the physician")[13] for patients who had outpatient encounters with the included oculoplastics attendings were obtained during the study period, and monthly values were also standardized relative to the patient satisfaction scores obtained in April 2018 for purposes of reporting and comparison. Scores obtained during and immediately after EHR implementation (September 2018 and October 2018) were excluded in analysis as the transition process was foreseen to be a potentially disruptive time to patients.

For the time-motion component of the study, observations were conducted during 4 half-day clinic sessions 2 weeks before EHR implementation and again during 4 half-day clinic sessions 6 weeks after EHR implementation. Data collected for each patient whose encounter was observed included demographic information (age, gender, ethnicity, primary language), visit type (new patient evaluation, routine follow-up, or visit within 90 days postoperative), and timing outcomes. Changes in the following timing outcomes were assessed: wait time (defined as the duration from scheduled appointment time to the start of attending physician exam, which could include evaluation by technician, resident or fellow, and any ancillary testing) and total visit time (defined as the duration from scheduled appointment time to the time the oculoplastics attending completed his interaction with the patient). Scheduled appointment time was used instead of using patient's arrival or check-in time in order to avoid biases from patients checking in earlier than their scheduled appointment time.

Physician Time Spent in Documentation and With Patients.

Time expenditures by oculoplastics attendings were also evaluated using manual time-motion observations 2 weeks before and 6 weeks after EHR implementation. Trained observers followed the oculoplastics attendings during patient encounters and recorded how much total time was spent on each patient, as well as how much time was specifically dedicated to documentation. All activities during the observed clinic session were included in the time-motion observations. Thus, for both paper charts and for EHR use, time spent documenting before or after the face-to-face patient encounter (i.e., in the hallway, or in the physician's office or workstation) during the observed clinic session was also included in the documentation time metric, not just documentation time spent in the room during the patient's encounter.

Timing data for oculoplastics attendings and for patients were collected by trained observers using a customized data entry tool (Numbers; Apple, Inc, Cupertino, CA, U.S.A.) with prespecified dropdown menus to promote ease of data entry and minimize interobserver variability. All observers underwent a didactic training session as well as pilot training sessions to ensure accuracy and consistency of data collection. Pilot training data were not included in the final analysis. All observers were trained to limit interactions with clinic staff and with patients to minimize the Hawthorne effect.

Statistical Analysis.

Descriptive summary statistics were generated for physician demographics, patient demographics, and the outcomes listed above. To compare changes in clinical volume, reimbursement, patient satisfaction, and timing outcomes before and after EHR implementation, t test hypothesis testing was performed. p values < 0.05 were defined as being statistically significant. All statistical analyses were conducted in R (RStudio Team (2016). RStudio: Integrated Development Environment for R. RStudio, Inc., Boston, MA, http://www.rstudio.com.).[14]

RESULTS

Characteristics of the Oculoplastics Practice.

The oculoplastics practice observed in this study consisted of the outpatient ambulatory clinics of 2 senior oculoplastics attendings at a single academic medical center. Both were male. Their mean number of years of clinical practice as attendings at the institution was 18 years, and both had an academic rank of Professor. Both had prior experience with the enterprise-wide EHR platform in the operating room/surgical suite as well as for inpatient and emergency oculoplastics consultations. Before the EHR implementation in September 2018, all clinical documentation in their outpatient practice was conducted on paper charts, although an electronic system (Cadence, EPIC) was in place for registration and scheduling. Neither attending had prior experience with the specific EHR ophthalmology module before the implementation. Both oculoplastics attendings played active roles as liaisons between the ophthalmology department and the institutional information technology leadership team prior to implementation and assisted with evaluating the specialized oculoplastics examination tab within the broader ophthalmology module and advised EHR analysts regarding modifications of the tab's elements.

For the first few weeks of the implementation, although all documentation of new encounters occurred within the EHR, paper charts were available in the clinic as a reference for prior encounters. By 6 weeks after implementation, when the time-motion observations for this study were repeated, paper charts were no longer being used.

Clinical Volume.

The total number of clinic encounters evaluated during the authors study period was 5,722 completed over 193 half-day clinics. The mean number of patients seen in a half-day clinic decreased from 31.8 averaged across the 6 months before EHR implementation to 27.7 averaged across the 6 months after implementation ($p = 0.018$; Table 1). An average of 10.9 versus 8.8 ($p < 0.001$) patient encounters were completed per hour pre- and post-EHR. A longitudinal depiction of the mean number of patient encounters per hour during the study period is illustrated in Figure 1.

Reimbursement and RVUs.

Monthly reimbursement was standardized as a ratio of the magnitude of reimbursement from April 2018, which was defined as 1.0 (baseline). Despite decreased clinical volume, both total monthly reimbursement ($p = 0.88$) and total RVUs ($p = 0.54$) remained stable after EHR implementation. Furthermore, on a per-patient basis, average reimbursement ($p = 0.004$) and RVUs ($p = 0.001$) per patient encounter were significantly higher with EHR use (Table 1). Reimbursement and RVUs per patient encounter during the study period are illustrated in Figure 2A,B, respectively.

Patient Experience.

Patient Satisfaction: Press Ganey surveys were collected before (n = 135) and after EHR implementation (n = 152). Patient satisfaction was also standardized as a ratio of the magnitude of Press-Ganey survey scores from April 2018, which was defined as 1.0 (baseline).

Mean patient satisfaction was higher during the 6 months after EHR implementation compared with the 6 months before EHR implementation (1.06 vs. 0.94; $p = 0.018$; Table 1).

Patient Wait Times: Timing outcomes for patients were measured using manual time-motion observations 2 weeks before and 6 weeks after EHR implementation. The mean (standard deviation) age of patients observed before EHR implementation was 62.8 years (17.3 years), and the mean (standard deviation) age of patients observed after EHR implementation was 60.8 years (15.2 years) ($p = 0.40$). There were no significant differences in the distribution of gender or ethnicity for observed patients before and after EHR implementation (Table 2). The most frequent visit type among encounters observed before EHR implementation were postoperative visits within 90 days of surgery (49 encounters of 115 total, 43%), whereas routine follow-up or return visits comprised the greatest proportion of encounters observed after EHR implementation (25/79 encounters, 32%; $p < 0.001$).

The mean patient wait time per encounter—defined as the number of minutes between the scheduled appointment time and the time the attending physician entered the room—decreased after EHR implementation by 9.1 minutes ($p = 0.03$). Mean total visit time—defined as the number of minutes between the scheduled appointment time and the end of the oculoplastics attending interaction in the clinic room decreased by 7.9 minutes, although not statistically significant ($p = 0.10$).

Time Utilization of Oculoplastics Attendings.

Direct measurement of time expenditures of oculoplastics attendings during the visit were recorded 2 weeks before and 6 weeks after EHR implementation. The mean total time spent an oculoplastics attending with each patient (including documentation) increased from 6.4 minutes using paper charts to 9.0 minutes after EHR implementation ($p < 0.001$). Looking at time spent specifically on documentation during the visit, mean documentation time per patient increased from 1.7 to 3.6 minutes ($p < 0.001$; Table 3).

DISCUSSION

The author's study demonstrates that although EHR implementation was associated with increased documentation time and decreased clinical volume, monthly total reimbursement remained stable. Furthermore, patient experience improved after EHR implementation as demonstrated by improved patient satisfaction scores and decreased wait times.

Productivity: Clinical Volume and Reimbursement.

The authors finding that EHR use was associated with lower clinical volume during the first 6 months after EHR implementation provides some evidence for current ophthalmologist beliefs that EHR adoption is associated with decreased clinical volume.[1] However, in retrospective studies conducted at other academic ophthalmology departments with follow-up periods of several years, clinical volumes did not significantly decrease over the long-term after EHR implementation.[8,9,11]

There were other productivity benefits associated with EHR use that mitigated this initial decrease in clinical volume. Despite 61% of ophthalmologists believing that charge capture per patient (proportion of charges captured for office visits, procedures, and tests) was the same or lower after EHR and only 19% of ophthalmologists believing that charge capture was increased in the recent survey by Lim et al.[1], the authors results showed that reimbursement and RVUs per patient increased significantly after EHR implementation. This improved charge capture (e.g., no loss of paper-based surgical abstracts) likely contributed to stable total monthly reimbursement despite decreased clinical volume. Additionally, the author's findings suggest more total physician time dedicated per patient visit, which may also reflect in higher level of service. The author's experiences support the findings of recent EHR studies in other medical fields suggesting that practice reimbursements per patient increase after EHR implementation despite long-term decrease in the number of patient visits seen in ambulatory care contexts.[15,16]

Patient Satisfaction.

Despite common provider perceptions that the patient experience may decline with more screen time and therefore less patient eye-contact or interaction,[17,18] the authors found that patient satisfaction scores improved after EHR implementation. The disruptions to the patient experience during the paper-to-EHR transition were likely minimized by extensive preimplementation preparation by the oculoplastics attendings and the health information technology support staffvia both formal and informal training sessions, development of personalizations within the EHR prior to implementation, and multiple "dress rehearsals." In addition, oculoplastics attendings received intensive floor support at the time of implementation to facilitate rapid learning and acclimation to the EHR and to achieve real-time troubleshooting of any issues. The oculoplastics attendings also maintained active communication with their patients about the transition, thereby allowing patients to have appropriate expectations during the implementation process.

Timing Outcomes.

Oculoplastics attendings spent a significantly greater amount of total time and documentation time on each patient when using the EHR compared to using paper charts. This supports findings from previous studies that EHRs impose a substantial time burden on ophthalmologists.[2,10] However, the timing data reported here were collected 6 weeks after implementation, during which the oculoplastics attendings were likely still learning and acclimating to the new EHR-based workflows. Whether and how much documentation efficiency improves over the long-term represents an area for future investigation.

Despite longer time requirements for the oculoplastics attendings, patient wait times significantly decreased after EHR implementation. This initially might seem counterintuitive. However, this finding could be explained by improved efficiency in other components of the visit besides the interaction with the oculoplastics attending, which represents a very small portion of the patient's overall visit. Here, wait times were defined as the duration of time between the scheduled appointment time and the first contact with the oculoplastics attending. Therefore, this wait time period could include elements of the visit such as checking in at the front desk, the initial evaluation by an ophthalmic technician, an evaluation by a resident or fellow, and any ancillary imaging or testing required before evaluation by the oculoplastics attending. Before EHR implementation, paper charts were a constrained physical resource, such that only one person could work on a chart at a single time. In contrast, with the EHR, multiple people on the care team could be accessing a patient's chart and working on different elements simultaneously. In addition, the availability of timestamp data displayed in the EHR allowed easy detection of where a patient was in the course of the clinic visit, allowing easier identification of bottlenecks and appropriate allocation of resources to relieve those bottlenecks (e.g., patients waiting longest could be identified and prioritized). As a result, although oculoplastics attendings themselves required slightly more time (~2 minutes per patient) to complete documentation, improved efficiency in the overall clinical workflows allowed patients to have shorter wait times.

Indeed, simulation studies based on EHR timestamp data have been used in other contexts, most notably in pediatric ophthalmology,[19–21] to facilitate workflow efficiency and optimize patient scheduling. Future studies in oculoplastics, which presents some unique challenges such as high patient volumes and a high frequency of in-clinic procedures, could also potentially leverage these timestamp data to further improve efficiency of workflows, with the goal of improving both patient and physician satisfaction.

Limitations.

One limitation of the study is the relatively brief follow-up period due to the relative recency of the EHR implementation at the authors institution. However, this allowed a detailed analysis at the early period after EHR implementation. In addition, the manual time-motion observations included a potential Hawthorne effect—defined as individuals modifying an aspect of their behavior in response to their awareness of being observed. Despite this possible observer effect in any situation of observed behavior, the authors did not find any difference in clinical volume, reimbursement, or patient satisfaction during the clinic sessions that were observed versus nonobserved, thus suggesting that there was minimal observer effect on provider behavior. Secondly, the author's study was performed in an academic practice, which may limit generalizability to nonacademic settings.

CONCLUSION

By providing a comprehensive analysis of multiple aspects of an oculoplastics practice undergoing a paper-to-EHR transition, the author's study shows that EHR implementation can be efficiently and effectively achieved with appropriate preparation, available technical support staff, and willingness to embrace change. Further study on how ongoing adaptations to future EHR upgrades and advancements in health information technology—and how those may be specifically tailored to oculoplastics workflows—will be relevant in this rapidly developing EHR climate.

Acknowledgments

Supported by the National Institutes of Health (Bethesda, MD; grant numbers T15LM011271, P30EY022589, UL RR031980), by the Heed Ophthalmic Foundation Fellowship (San Francisco, CA), and by an unrestricted departmental grant from Research to Prevent Blindness (New York, NY).

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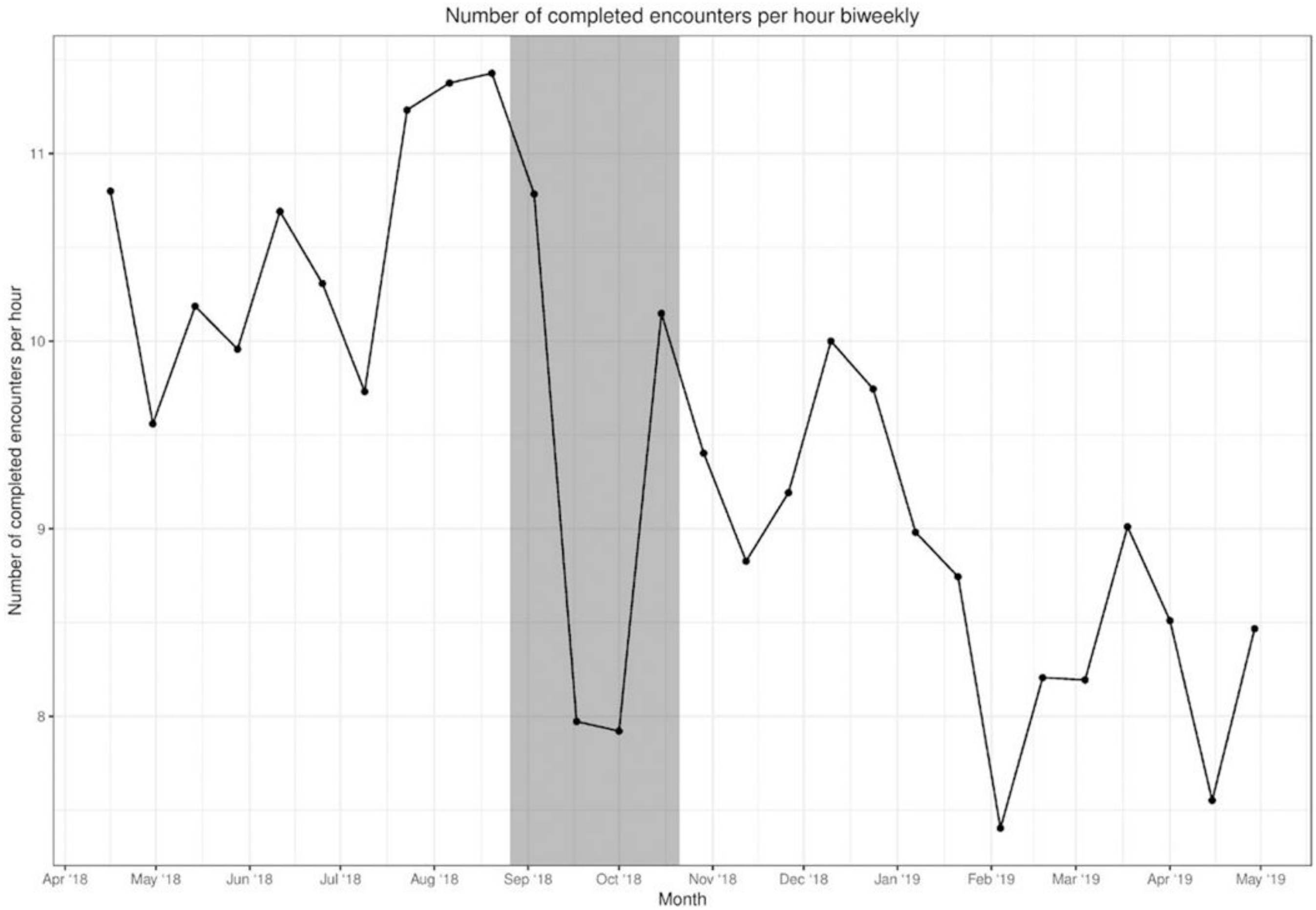

FIG. 1.

Average number of completed encounters per hour before and after electronic health record implementation, which occurred in late September 2018, corresponding to the left boundary of the *gray box*. Clinic scheduling templates were deliberately reduced the first 3 weeks after implementation. Data points affected by deliberate reduction of clinic volume have been encompassed within the timeframe shaded in *gray*.

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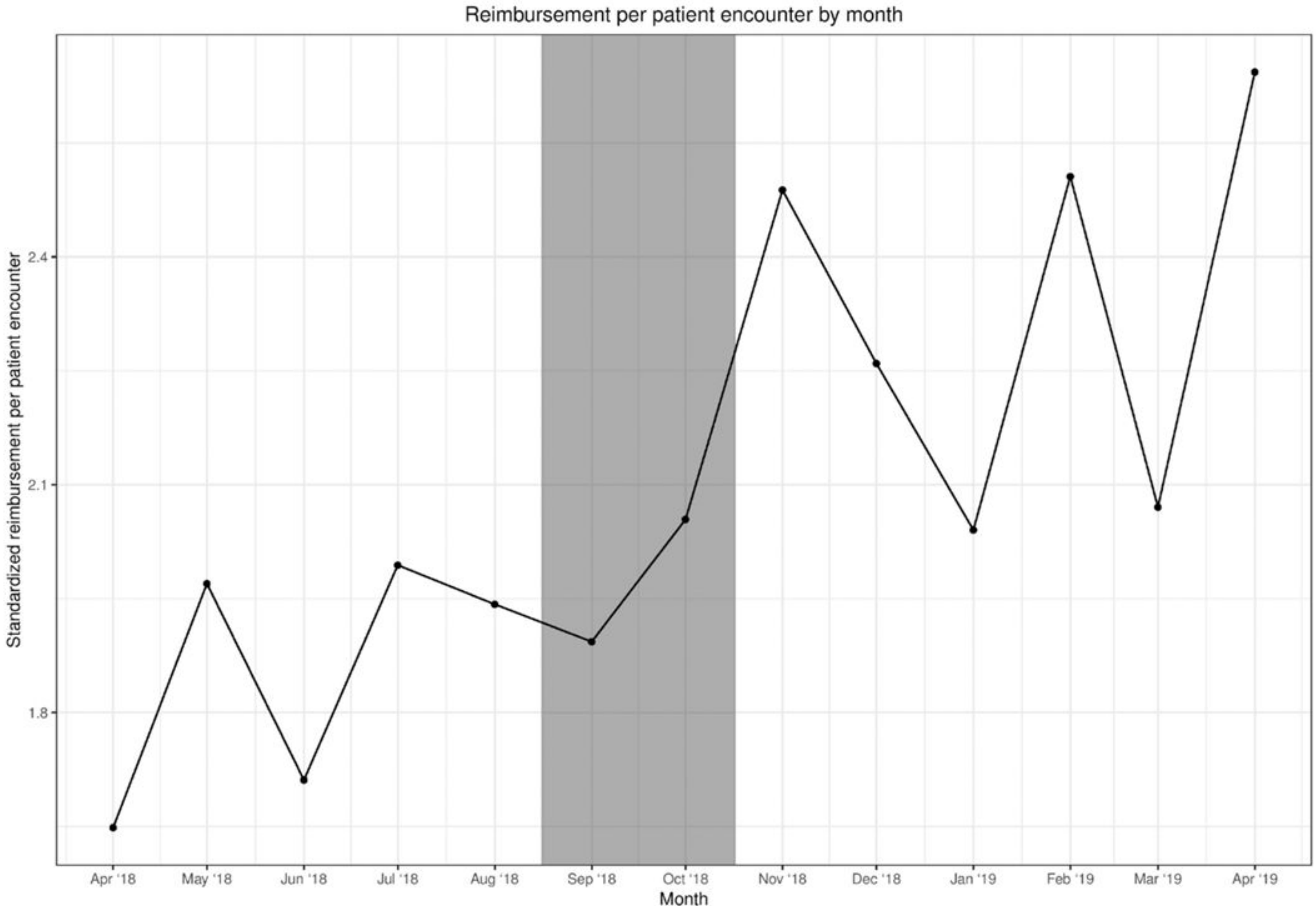

FIG. 2.

A, Reimbursement per patient encounter. Monthly reimbursements were standardized as a ratio of the magnitude of reimbursement from April 2018 which was used as a baseline. *y* axis is calculated as standardized monthly reimbursement divided by number of monthly patient encounters (multiplied by 10^3 for ease of comparison). Data points affected by deliberate reduction of clinic volume have been encompassed within the timeframe shaded in *gray*. **B**, Relative value units (RVUs) per patient encounter. Monthly RVUs were standardized as a ratio of the magnitude of RVUs from April 2018 which was used as a baseline. *y* axis is calculated as standardized monthly RVUs divided by number of monthly patient encounters (multiplied by 10^3 for ease of comparison). Data points affected by deliberate reduction of clinic volume have been encompassed within the timeframe shaded in *gray*.

TABLE 1.

Clinical volume, reimbursement, and patient satisfaction during the 6 months before EHR implementation (“Pre-EHR”) and the 6 months after EHR implementation (“Post-EHR”) from April 2018 to April 2019

	Pre-EHR	Post-EHR	Difference in means [95% CI]	*p*
Clinical volume				
Mean no. patients seen in a half-day clinic	31.8	27.7	−4.1 (−0.7 to 7.5)	0.018
Mean no. patient encounters completed per hour	10.9	8.8	−2.1 (−1.3 to −2.8)	< 0.001
Reimbursement and RVUs (monthly mean)				
Monthly reimbursement [*]	0.998	1.008	+0.010 (−0.157,0.138)	0.88
Monthly RVUs [†]	0.929	0.895	−0.034 (−0.086,0.154)	0.54
Monthly reimbursement per patient encounter [‡]	1.85	2.29	+0.034 (0.176,0.706)	0.004
Monthly RVUs per patient encounter [§]	1.72	2.04	+0.32 (0.170−0.471)	0.001
Patient satisfaction (monthly mean)				
Mean standardized patient satisfaction scores [¶]	0.94	1.06	+0.12 (0.027−0.220)	0.018

[*] Monthly reimbursements were standardized as a ratio of the magnitude of reimbursement from April 2018 which was used as a baseline.

[†] Monthly RVUs were standardized as a ratio of the magnitude of RVUs from April 2018 which was used as a baseline.

[‡] Calculated as standardized monthly reimbursement divided by number of monthly patient encounters (multiplied by 10^3 for ease of comparison).

[§] Calculated as standardized monthly RVUs divided by number of monthly patient encounters (multiplied by factor of 10^3 for ease of comparison).

[¶] Monthly patient satisfaction scores were standardized as a ratio of the magnitude of the mean patient satisfaction scores from April 2018 which was used as a baseline.

EHR, electronic health record; RVU, relative value unit.

TABLE 2.

Demographics of observed patients during the time-motion component of the study

	Pre-EHR (n = 115 patient encounters)	Post-EHR (n = 79 patient encounters)	*p*
Age, years, mean (SD)	62.8 (17.3)	60.8 (15.2)	t= 0.84; $p = 0.40$
Gender, n (%)			
Female	69 (79)	59 (47)	$\chi^2 = 6.68$; $p = 0.08$
Male	31 (36)	35 (28)	
Visit type, n (%)			
New	24 (28)	32 (25)	$\chi^2 = 19.1$; $p < 0.001$
Return	33 (38)	48 (38)	
Postoperative	43 (49)	16 (13)	

Patient encounters were observed 2 weeks before EHR implementation (“Pre-EHR”) and 6 weeks after EHR implementation (“Post-EHR”).

EHR, electronic health record; SD, standard deviation.

TABLE 3.

Timing outcomes for oculoplastics attendings 2 weeks before EHR implementation (“Pre-EHR”) and 6 weeks after EHR implementation (“Post-EHR”)

	Pre-EHR (n = 115 patient encounters)	**Post-EHR (n = 79 patient encounters)**	**Difference in means (95% CI)**	***p***
Mean total time spent by oculoplastics attendings per patient (minutes)	6.4 (4.1)	9.0 (5.8)	+2.6 (1.1,4.1)	< 0.001
Mean documentation time per patient (minutes)	1.7 (1.2)	3.6 (2.1)	+1.9 (1.7,2.7)	< 0.001

EHR, electronic health record.