Transitioning Electronic Health Records: Effect on Residents documentation and compliance with evidence-based medicine.

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Background

In July of 2013, the Kresge Eye Institute's electronic health record (EHR) underwent a major software update. Our goal was to measure the impact of technological transition in our residency program. We evaluated the effect of EHR template design on resident education by evaluating compliance with established practice guidelines. We used evidence-based elements extracted from the American Academy of Ophthalmology Preferred Practice Pattern (AAO PPP) for Dry Eye Syndrome (DES) to measure the quality of the resident's clinical note. Compliance with preferred practice patterns can lead fewer patient complications and possible reduction in the overall cost of medical care.[1, 2] Compliance with guidelines ensures that residents provide quality patient care early in their careers in addition to integrating evidence-based medicine into their practice.[1, 3-4] The goal of our study was to determine if the EHR template for chart notes played a role in the resident's documentation and compliance with the AAO PPP for DES.

PLAN

The aim of this study was to determine the role of EHR software in resident education by evaluating documentation of 30 elements extracted from the American Academy of Ophthalmology on Dry Eye Syndrome Preferred Practice Pattern.

DO

The Kresge Eye Institute (KEI) ophthalmology residency has seven residents in each year of a three-year ophthalmology residency. In June of 2013, KEI changed EHR systems, therefore impacting different aspects of outpatient care including chart note documentation. We evaluated the charts of 451 patients that were seen by a total of 36 residents in the resident ophthalmology clinic between September 1, 2011 and December 8, 2014 for an initial visit of DES. We labeled EHR-A as the software used before June of 2013 and EHR-B as the upgraded software. Resident chart notes were evaluated for documentation of 30 elements extracted from AAO PPP for DES (2011 edition). These elements were chosen based on their level of evidence and relevance to the diagnosis, treatment and patient education of DES.[5] The elements were grouped into four sections that comprise the ophthalmological clinical note: past medical history, physical exam, management and patient education. We compared documentation rates for the 30 elements between the EHRs and among resident years using SPSS analysis software version 23. A *P* value of less than 0.05 was considered statistically significant.

This study was reviewed and granted approval by the Wayne State University Institutional Review Board.

ACT

- Overall, EHR-A had high compliance (>90%) in 16 elements while EHR had high compliance (>90%) in 11 elements.
- Interestingly, even though EHR-B had fewer elements with high compliance (>90%) its implementation increased documentation of four elements: contact lenses wear, adnexa findings, puncta findings and proptosis
- In our study, decreased documentation likely resulted from "mouse click fatigue" as residents had to access multiple dialogue boxes to document certain elements. This phenomenon affected all residents regardless of their year in training.
- The content and quality of the EHR chart note template plays an important role in guiding documentation. Transitions in EHR have a significant effect on the quality of the resident's clinical note.
- EHR design factors can be responsible for the success or failure to adherence to preferred practice guidelines. Future quality studies should focus on EHR design and the creation of customized templates for medical residents.
- This study highlights the importance of cooperation between EHR companies and medical community to improve template design and therefore improve patient care.

STUDY

Figure 1: Total Documentation Percentage of Ophthalmology Residents

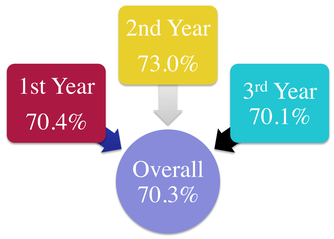


Figure 2: Total Documentation Percentage of Chart Note Template Versions

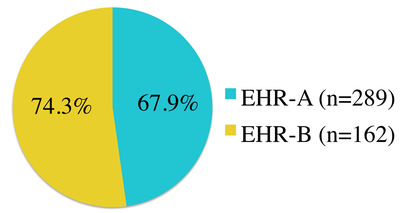


Figure 3: Total Documentation Percentage of Ophthalmology Residents Based on EHR tempate

	Preferred Practice Pattern Element	% Documentation			
		All Years (n=451)	EHR-A (n=289)	EHR-B (n=162)	*p*
Past Medical History	Ocular signs and symptoms	96.7	97.6	95.2	0.164
	Exacerbating conditions	74.7	81.3	63.0	<0.001
	Duration of symptoms	81.3	78.5	86.1	0.048
	Ocular medications and effect on symptoms	82.6	85.5	77.7	0.036
	Ocular surface disease	88.4	91.7	82.5	0.003
	Ocular trauma	88.4	91.7	82.5	0.003
	Ocular surgical history	88.4	91.7	82.5	0.003
	Contact lenses wear	26.4	9.3	56.4	<0.001
	Facial washing (eyelash and eyelid hygiene)	2.4	2.8	1.8	0.527
	Systemic medications	92.5	91.7	94.0	0.373
	Systemic medical history	97.1	97.2	97.0	0.881
	Systemic surgical history	97.1	97.2	97.0	0.881
	Allergies	93.2	94.8	90.4	0.070
	Menopause	0.0[a]	0.0[b]	0.0[b]	N/A[b]
	Smoking exposure	90.5	97.6	78.3	<0.001
Total Compliance		74.9	75.5	73.8	0.094

	Preferred Practice Pattern Element	% Documentation			
		All Years (n=451)	EHR-A (n=289)	EHR-B (n=162)	*p*
Physical Exam	Best corrected visual acuity	97.4	96.9	98.2	0.399
	Skin examination	80.0	94.5	54.8	<0.001
	Cranial nerve examination	0.0	0.0	0.0	N/A
	Eyelids and eyelashes	98.2	99.7	95.8	0.002
	Adnexa	33.4	3.8	84.9	<0.001
	Puncta	33.4	3.8	84.9	<0.001
	Proptosis	33.4	3.8	84.9	<0.001
	Conjunctiva	99.8	99.7	100.0	0.448
	Cornea	99.8	99.7	100.0	0.448
	Tear film	99.8	99.7	100.0	0.448
	Total compliance	67.5	60.2	80.4	<0.001
Care Management	Address contributing factors	69.2	69.6	68.7	0.846
Patient Education	Counsel on chronic nature	2.6	1.7	4.2	0.111
	Instructions on treatment regimen	99.3	99.3	99.4	0.909
	Refer if systemic symptoms are present	60.0	60.0	[c]	[c]
	Caution that LASIK may worsen symptoms	[d]	[d]	[d]	[d]
	Total compliance	51.0	50.6	51.8	0.171

Figure 4: Example of Documentation Percentage Variability of Residents when Separated by Chart Note Template Version

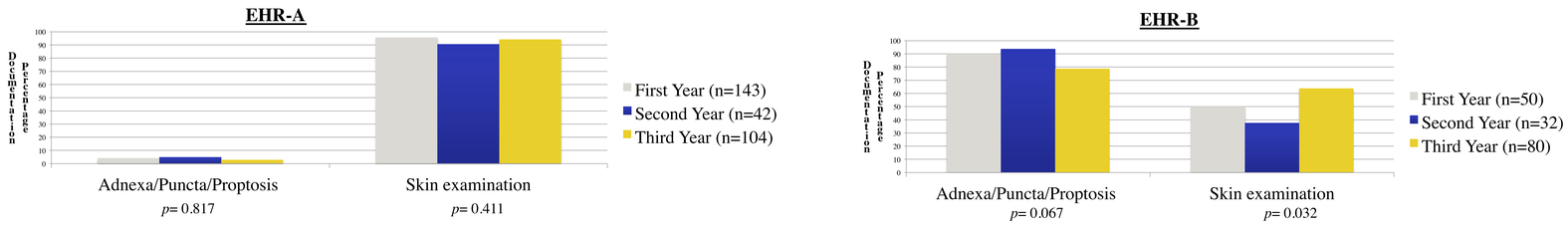
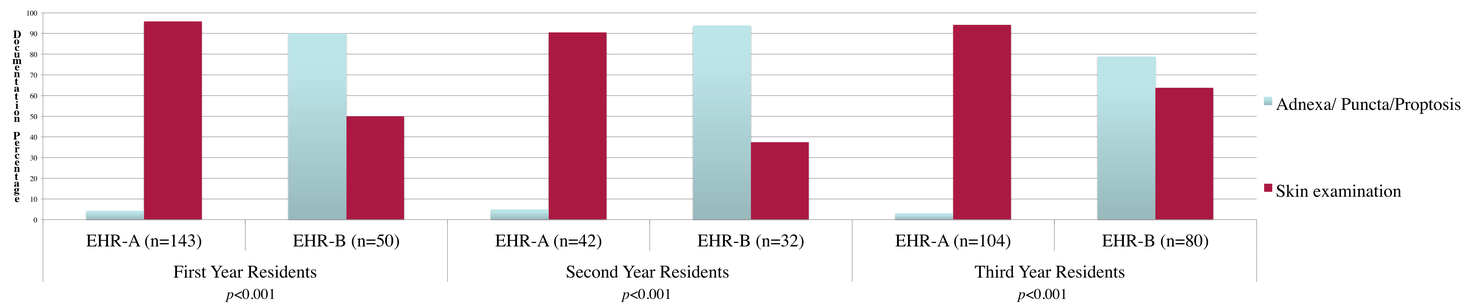


Figure 5: Example of Documentation Percentage variability with Chart Note Template Versions when Separated by Residency Years



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