Utilizing EHR use data to quantitatively evaluate tailored EHR training

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Utilizing EHR use data to quantitatively evaluate tailored EHR training

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Background

- EHRs have become ubiquitous in healthcare.[1]
- There is a sparsity of data on effective EHR education strategies for clinicians.
- Targeted EHR training for the individual provider may be a strategy to reduce the EHR burden.
- Previous studies on targeted EHR training have assessed only subjective data, utilizing self-reported surveys to show improved provider efficiency and satisfaction after training.[2-6]
- Our study is the first to employ system-use data to objectively evaluate the effects of a targeted two-arm training program consisting of EHR classes called “Thrive” and one-on-one customizable EHR support sessions called “elbow-to-elbow (E2E)”.

Problem Statement

Does tailored EHR training decrease provider time spent in the EHR?

Methods

- IRB-exempted (non-human subjects) mixed prospective and retrospective crossover study at ambulatory practices in a single health network.
- Data collected from training lists and monthly Epic PEP reports.

Population: Providers who attended a Thrive class or utilized E2E support between March 2017 - January 2018.

- Incomplete or missing data was excluded.

Intervention: E2E/Thrive training.

Comparison: No additional training (prior to E2E/Thrive).

Outcome: Change from baseline in daily time spent in Epic at 30 days and 90 days after E2E/Thrive training as compared to 30 days and 90 days after no additional training.

- Documentation, order management, chart review, problem list, and in-basket.

Statistical Analyses

- Two-tailed t-tests with significance set at 0.05.

Results

Table 1. Provider Demographics

		Provider Count
Certification	CNM	1
	CRNP	23
	DNP	1
	DO	38
	MD	110
	PA	35
	PhD	1
	RN	1
	Unknown	2
Specialty	Cardiology	16
	Cardiothoracic Surgery	2
	Endocrine	3
	ExpressCare (Urgent Care)	16
	Family Medicine	63
	General Surgery	7
	Intensive Care	1
	Infectious Disease	1
	Internal Medicine	27
	Maternal Fetal Medicine	6
	Neurology	4
	Neurology/Psychology	1
	Neurosurgery	4
	Obstetrics and Gynecology	20
	Oncology	3
	Orthopedics	1
	Pain Medicine	6
	Pediatrics	9
	Pediatric Surgery	1
	Physiatry	4
	Psychiatry	2
	Pulmonology	2
	Rheumatology	3
	Urology	10
Training type	E2E only	187
	Thrive only	22
	Both	3
Number of sessions	1	178
	2	29
	3	4
	4	1
	5	1
Training month	March	6
	April	14
	May	24
	June	24
	July	12
	August	36
	September	21
	October	27
	November	3
	December	46
	January	37

257 providers participated in targeted EHR training at our health network between March 2017 - January 2018.

Table 2. Change in Time Spent in Epic from Baseline*

Month		Control (mins)	E2E/Thrive (mins)	p-value
March	30 days	-2	-2	0.997
	90 days	-2	15	0.091
April	30 days	0	2	0.683
	90 days	-3	-4	0.721
May	30 days	-5	3	0.002
	90 days	-4	2	0.011
June	30 days	-2	2	0.052
	90 days	-1	0	0.635
July	30 days	-8	-3	0.163
	90 days	-6	-1	0.146
August	30 days	2	3	0.855
	90 days	-2	-1	0.927
September	30 days	9	3	0.129
	90 days	8	-2	0.049
October	30 days	3	1	0.414
	90 days	5	-1	0.049
December	30 days	-1	2	0.035
	90 days	-1	-2	0.487
January	30 days	-5	-2	0.220
	90 days	-4	-1	0.223
Overall	30 days	-1	1	0.014
	90 days	-1	-1	0.537

*November was excluded due to missing/insufficient data

Table 3. Change in Time Spent in Epic by Category

Categories		Control (mins)	E2E/Thrive (mins)	p-value
Clinical Review	30 days	0	1	0.615
	90 days	0	-1	0.570
Orders	30 days	-3	6	0.004
	90 days	-3	3	0.076
Schedule/Patient Lists	30 days	0	2	0.057
	90 days	-1	3	0.019
In Basket	30 days	-1	1	0.099
	90 days	0	-1	0.787
Notes	30 days	-2	-1	0.636
	90 days	-3	-4	0.578
Overall	30 days	-1	1	0.014
	90 days	-1	-1	0.537

Overall, significant +2 mins/day after targeted EHR training at 30 days post-intervention as compared to no training (p = 0.01). This difference disappeared at 90 days.

Table 4. Change in Time Spent in Epic by Category (E2E)

Categories		Control (mins)	E2E (mins)	p-value
Clinical Review	30 days	0	1	0.733
	90 days	0	0	0.806
Orders	30 days	-3	6	0.015
	90 days	-3	4	0.057
Schedule/Patient Lists	30 days	0	1	0.146
	90 days	-1	3	0.021
In Basket	30 days	-1	1	0.101
	90 days	-1	-1	0.986
Notes	30 days	-2	-2	0.931
	90 days	-2	-4	0.367

Nonsignificant decreases in daily time spent in clinical review, in-basket, and notes after E2E/Thrive EHR training.

Significant +4 mins/day spent in schedule/patient lists at 90 days after E2E/Thrive training (p = 0.02).

Table 5. Change in Time Spent in Epic by Category (Thrive)

Categories		Control (mins)	Thrive (mins)	p-value
Clinical Review	30 days	-2	0	0.623
	90 days	0	-4	0.290
Orders	30 days	-4	6	0.063
	90 days	-2	-3	0.903
Schedule/Patient Lists	30 days	-4	2	0.097
	90 days	-3	-1	0.717
In Basket	30 days	0	0	0.852
	90 days	3	-4	0.024
Notes	30 days	4	0	0.703
	90 days	-2	-9	0.446
Overall	30 days	-1	2	0.240
	90 days	-1	-5	0.179

Significant +9 mins/day spent in orders at 30 days after E2E/Thrive training (p = 0.004) but this significance disappeared at 90 days.

E2E training alone outcomes mirrored those of the general population while Thrive training alone significantly -7 mins/day spent in in-basket at 90 days (p = 0.02).

Table 6. Change in Time Spent in Epic After Repeated Training

Categories		Control (mins)	E2E/Thrive (mins)	p-value
Clinical Review	30 days	0	2	0.646
	90 days	3	2	0.240
Orders	30 days	-2	5	0.144
	90 days	2	9	0.265
Schedule/Patient Lists	30 days	-1	-2	0.594
	90 days	1	1	0.775
In Basket	30 days	-3	4	0.034
	90 days	-3	-3	0.986
Notes	30 days	1	0	0.470
	90 days	6	-12	0.016
Overall	30 days	-1	1	0.318
	90 days	2	-2	0.193

There was a significant -18 mins/day spent writing notes at 90 days after the last training session in a subgroup analysis of providers who underwent more than one training session (p = 0.02).

Discussion

- No significant improvements in Epic time after one-time tailored EHR training.
- Increased time in some categories after training could be due to learning and practicing new EHR functions and selection bias.
- Time may not the best indicator of training success and future studies can evaluate for other measures of EHR training success (e.g., in-basket % responses or % of correct orders inputted).

Project Limitations

- Confounding variables
- Selection bias

Relationship to SELECT Principles

- This project was a multidisciplinary collaboration to improve the quality of our current health systems.
- Currently there is no gold standard for evaluating EHR training success.
- By introducing an objective measure gained from system-use reports, our study lays the groundwork for future studies to use other such trackable metrics to assess and evolve future EHR training programs.

Conclusions and Future Implications

- Although tailored/individualized EHR training in the ambulatory setting may increase provider self-reported efficiency and workplace satisfaction, such programs might not decrease provider time spent in the EHR.
- However, EHR time may be decreased after repeated training sessions.
- EHR system-use data is a viable source to assess and track the effects of different educational interventions since these reports can be made available to the institution at regular intervals and contain many different objective metrics of EHR use.

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