The Impact of Portable Electronic Devices on Attending Rounding Behaviors of Inpatient Internal Medicine Teams at an Academic Medical Center

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Introduction

Portable electronic devices give health care professionals the ability to access electronic evidence based medicine resources and the electronic health record (EHR) without restricting them to stationary desktop computers. There is general concern that the EHR will compel caregivers to spend less time with their patients; there is significant evidence in a prior unpublished study to support this unintended consequence.

Research Question

Do portable tablet computers promote efficiency and care with ward rounding while maintaining access to the EHR and other digital resources without significantly increasing distractions for internal medicine teams?

Materials and Methods

Internal medicine inpatient teams were observed over a 28 day period at Parkland Memorial Hospital on non-admitting days. Teams were randomized to intervention and control arms.

Intervention teams were provided with tablet computers (Lenovo Thinkpad 2) for the duration of the study. Intervention groups were given a brief tutorial on use of the tablets and then informed that best practice for tablet usage was believed to be performing attending rounds on the wards. No further feedback on rounding behavior was given to control or intervention teams thereafter.

Two observers (kappa 0.93) recorded behaviors on a standardized checklist, which included observation domains of patient care, EHR use, and distractions.

Data were compiled and figures were calculated using SAS software suite.

Results

323 patient encounters were recorded in the context of eighteen rounding teams, fourteen control (160 encounters) and four intervention (163 encounters).

Key Characteristics of Study Arms			
Variable	Control	Intervention	p-value
Tablet Used (y/n)†	18.13%	50.31%	< 0.0001
Tablet Use Count ✱	0.29	1.18	< 0.0001
Other Tech Use Count✱	1.71	0.82	< 0.0001
Total Tech Use Count✱	2.01	2.00	0.3637
Tablet Distraction Count✱	0	0.26	< 0.0001
Total Distraction Count✱	1.84	2.60	0.0045
% of Rounds on Wards†	34.38%	71.17%	< 0.0001
Time per Patient (minutes) ✱	12.37	10.62	0.0118
Time at Bedside (minutes) ✱	3.28	3.71	0.6358

†percent of all encounters
✱ Average count per encounter

In intervention groups, on average 34.91% of time spent on each patient was at the bedside. Control groups spent 26.49%.

Average EHR Accesses per Patient Encounter				
		Study Branch		
		Control	Intervention	p-value
Rounding Location	Room	2.44	2.29	0.1044
	Ward	1.18	1.88	0.0318

Average Distractions Experienced per Patient Encounter				
		Study Branch		
		Control	Intervention	p-value
Rounding Location	Room	1.52	1.11	0.1159
	Ward	2.43	3.19	0.0298

The principle users of the tablet computers were the resident physicians and the sub-intern.

Discussion

This study suggests that possession and use of tablet computers is associated with increased ward rounding with the same level of access to EHR as would be offered by room rounding.

Tablet possession of the intervention group was associated with increased ward rounding, shorter time spent discussing each patient but increased time spent at the patient's bedside. This constellation of findings suggest increased efficiency. However, increased ward rounding may be due to the researchers conveying that best practice was believed to be ward rounding with the tablet computers

Intervention teams experienced more distractions than control teams, as is expected due to the increased amount of ward rounding. However, the tablets themselves contributed to the number of distractions.

The increased distractions related to technology experienced by intervention teams may be attributed to new tablets and dysfunctional ward hallway computers.

A potential limitation of this study is the restricted study duration, sample size, and tablet training.

Conclusion

The use of tablet computer is associated with higher EHR usage, shorter time spent discussing the patient, but more time with the patient. However, tablet usage was also associated with increased numbers of distractions.

Acknowledgments