The Impact of Resident Geographic Rounding on Rapid Responses

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INTRODUCTION

Geographic localization and interdisciplinary team rounding (IDTs) are increasingly prevalent within hospitals. Potential benefits include decreased length of stay,[1] improved physician-staff communication and collaboration,[2, 3] increased face time with patients,[2] enhanced efficiency,[2, 4, 5] decreased readmission,[6] and possibly even decreased healthcare costs.[1]

Although the implementation of these systems, geographic rounding and rapid response teams (RRT), are by no means "cutting edge," they are growing in popularity. As such, many challenges and possible benefits associated with these practice changes have yet to be clarified within the literature. With academic health systems incorporating growing numbers of learners into their rounds and as learner training emphasizes increased familiarity with nursing, could geographic rounding unlock potential benefits to patient care? This study specifically sought to determine if resident-run geographic units yielded a decrease in rapid responses.

METHODS

In 2017, the Internal Medicine (IM) residency ward service transitioned to a geographic-based rounding model covering two inpatient units. Prior to 2017, the two units were general telemetry units open primarily for medicine admissions. For this study, we used an observational pre-post design involving the IM residency ward service at Carilion Roanoke Memorial Hospital (CRMH) to compare the frequency of rapid responses both before and after we implemented a geographic rounding intervention.

We created a composite index consisting of rapid response rates for two years before and one year after implementation using chi-square (SAS Enterprise Guide 7.1). The periods were limited to July through December of each year to ensure full implementation on both units and to limit variation in resident training. A single event for each patient was included for analysis with the exception of one patient who had two rapid responses during the study period. For this patient, both events were included due to the focus on reductions of aggregate events rather than events per patient. In addition, we compared the two groups for case mix index and minimum Rothman index.

After expedited review by the Carilion Clinic Institutional Review Board, this study, protocol number 2530, was granted full approval.

RESULTS

There was a significant reduction in rapid response events (2.16% vs. 0.66%, $p < 0.0001$) (Table 1). The odds ratio of experiencing a rapid response event after geographic rounding was 0.30 (95% CI, 0.16 to 0. 56). There was no difference in the case mix index ($p = 0.74$) or minimum Rothman index ($p = 0.30$) between the two time periods (Table 2). The case mix index ($p = 0.7428$) and minimum Rothman index ($p = 0.3025$) for the groups on these units showed similar patient disease severity.

DISCUSSION

This study showed a decrease in rapid responses during the geographic-rounding implementation. We hypothesize that this was due to an increase in familiarity and communication with nursing staff; rapid responses likely were prevented as

Table 1 Rate of Rapid Response Events Pre- and Post-intervention

	Event	No event	Total	% of patients with event
Pre study (2015 and 2016)	58	2631	2689	2.16%
Post study (2017)	12	1813	1825	0.66%
Total	70	4444	4514	

Odds ratio 0.3
P value < 0.0001

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Table 2 Case Severity

Study group	Case mix index*			Minimum Rothman index†		
	Mean	Std. Dev.	*p* value	Mean	Std. Dev.	*p* value
Pre-intervention (2015–2016)	1.65	1.87	0.7428	38.34	26.79	0.3025
Post-intervention (2017)	1.60	1.68		39.45	26.46	

**Case mix data were collected on 278 patients in the pre-intervention group and 202 patients in the post-intervention group*
†Rothman index data were collected on 1328 patients in the pre-intervention group and 1146 patients in the post-intervention group

residents and nurses were quicker to take action with a declining patient.

However, there are several study limitations. Firstly, the study was limited by numbers of years evaluated and completeness of case mix and Rothman data. It also would have also been ideal to have another year or two of the geographic rounding to have established the consistency of the improvement on event decrease. However, structural changes were planned which would have made this extra year problematic. Secondly, our study design could have resulted in significant confounding; there could have been other interventions at the staff or nursing level that could also have affected rapid response rates or important differences in our patients that are not captured by our case mix or Rothman data. Finally, it is uncertain if we can generalize our results to non-teaching services.

Several questions remain. A larger, randomized trial would be ideal to confirm our preliminary findings. It would also be interesting to look at other measures such as mortality and ICU transfer rates.

Based on these preliminary and retrospective results, a resident-run geographic rounding service decreased rapid response rates at our institution. We theorize that the mere pervasive presence of numerous doctors (residents) on these units and the increase in communication and familiarity with the nursing staff are the likely reasons for the declines in rapid response rates. This fairly simple hospital structural change to admitting and rounding could easily be implemented at other facilities and other residencies as well as non-educational services.

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Compliance with Ethical Standards:

Conflict of Interest: *The authors declare that they do not have a conflict of interest.*

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