

RESEARCH LETTERS

Reductions in Telemetry Order Duration Do Not Reduce Telemetry Utilization

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The Society of Hospital Medicine's Adult Choosing Wisely measures include not ordering "continuous telemetry monitoring outside of the ICU [intensive care unit] without using a protocol that governs continuation."¹ Current guidelines for cardiac monitoring use recommend minimum durations for all adult class I and most class II indications.² However, telemetry ordering often fails to include timing or criteria for discontinuation. We determined the impact of a reduction in telemetry order duration within our hospital, hypothesizing this reduction would lead to earlier reassessment of telemetry need and therefore decrease overall utilization.

METHODS

Setting

Durham Veterans Affairs Medical Center (DVAMC) is a 151-bed tertiary care hospital within Veterans Affairs (VA) Integrated Services Network Region 6 (VISN 6) serving as the primary VA hospital for >54,000 patients and a referral hospital for VISN 6. Twenty-five telemetry units are available for use on 2 wards with 48 potential telemetry beds. All non-intensive care wards contain general medical and surgical patients, without a primary inpatient cardiology service. Most orders are written by housestaff supervised by attending physicians.

Intervention

Prior to our intervention, the maximum allowable duration of telemetry orders was 72 hours. The duration was enforced by nursing staff automatically discontinuing telemetry not renewed within 72 hours. For our intervention, we reduced the duration of telemetry within our electronic ordering system in November 2013 so that orders had to be renewed within 48 hours or they were discontinued. No educa-

tion regarding appropriate telemetry use was provided. This intervention was created as a quality-improvement (QI) project affecting all telemetry use within DVAMC and was exempt from institutional review board review.

Outcomes

Outcomes included the mean number of telemetry orders per week, mean duration of telemetry orders, mean duration of telemetry per episode, and the ratio of time on telemetry relative to the total length of stay. As a balancing measure, we examined rates of rapid response and "code blue" events. All measures were compared for 12 weeks before and 16 weeks after the intervention. Telemetry orders and durations were obtained using the Corporate Data Warehouse.

Analysis

All outcome measurements were continuous variables and compared using the Student *t* test in Stata version 9.2 (StataCorp, College Station, TX).

RESULTS

Following the intervention, overall order duration decreased by 33% from 66.6 ± 8.3 hours to 44.5 ± 2.3 hours per order ($P < 0.01$), mirroring the reduction in the maximum telemetry order duration from 72 to 48 hours (Table 1). However, an increase in telemetry order frequency after the intervention resulted in no significant change in telemetry duration per episode or the proportion of the hospitalization on telemetry (59.3 vs 56.3 hours per patient, $P = 0.43$; and 66.4% vs 66.2% of hospitalization, $P = 0.58$). Rapid response and code blue events did not differ significantly relative to the intervention (2.8 events per week before and 3.1 events per week after, $P = 0.63$).

DISCUSSION

Overall, telemetry utilization was unchanged in spite of an intervention successfully reducing telemetry order duration. Providers responded to this decreased order duration by increasing renewal orders, leaving the amount of time patients spent on telemetry unchanged.

Little primary evidence underlies the American Heart Association recommendations for duration of telemetry in general ward patients.² The existing

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TABLE 1. Telemetry Utilization Before and After the Quality Improvement Intervention

	Before Intervention	After Intervention	P Value
No. of hospitalizations with telemetry ordered	557	684	NA
No. of telemetry orders	952	1515	NA
Average no. of orders per week (SD)	79.3 (9.2)	94.7 (25.9)	0.06
Hours of telemetry per order (SD)	66.6 (8.3)	44.5 (2.3)	<0.01
Duration of telemetry per patient, h	59.3	56.3	0.43
% of hospitalizations receiving telemetry per patient	66.4%	66.2%	0.90
RRT/code blue events per week	2.8	3.1	0.63

NOTE: Abbreviations: NA, not applicable; RRT, rapid response team; SD, standard deviation.

literature documents the timing in which arrhythmias occur after cardiac surgery or myocardial infarction, and therefore is limited in guiding patient care outside intensive care unit settings.^{3,4} As such, hospitalists and inpatient providers have little data directing additional telemetry decisions for these patients, and none for patients requiring telemetry for other indications.

As interventions focusing solely on telemetry duration may not lead to changes in usage patterns, reducing telemetry utilization may require active stewardship. For example, explicit justification may be needed for renewal of telemetry orders. Similarly, education on appropriate telemetry indications in tandem with electronic ordering changes may be more likely to change behavior. Alternatively, incorporating data identifying chest pain patients at very low risk of developing arrhythmias or cardiac complications, based on published risk scores at the time of ordering, may lead to better decision making in initiating telemetry.^{5,6}

This QI project had several limitations. First, the intervention occurred in a facility with a previous telemetry order duration limit. In hospitals without a current duration limitation, some reduction in overall telemetry utilization may be possible. Second, this

project was a nonrandom before/after study and potentially subject to bias due to confounding. However, our limited number of telemetry resources, the relatively low number of inpatient teams at our facility, and the inability to target geographic locations for team admissions would have made a cluster-randomized trial impractical. Third, rationales for telemetry ordering were unknown, as well as drivers for increased orders after the intervention. Better understanding these factors could lead to targeted interventions in some settings.

CONCLUSION

In conclusion, a QI initiative reducing telemetry order duration did not reduce overall telemetry utilization but increased the number of telemetry orders written. Interventions incorporating appropriate telemetry indications or event risks may be required to change ordering behaviors.

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