Using electronic alerts to reduce telemetry overuse in a community teaching hospital

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Introduction

Telemetry monitoring is often overused in the inpatient setting. This has led to both an inefficient allocation of hospital resources as well as negatively impacting patient care. The American College of Cardiology/ American Heart Association (ACC/AHA) guidelines give recommendations for indication and duration of telemetry monitoring for specific patient populations (6). Therefore, hospitals can focus on lowering the rates of telemetry monitoring in patients without guideline indications (non-indicated), in order to avoid overuse. To address wasteful medical spending, hospitals have designed protocols using clinical decision support systems (CDSS) to guide in efforts to decrease telemetry overuse. Multiple studies have shown the effectiveness of both SWR pop-ups and electronic ordering systems in improving adherence to the ACC/AHA guidelines (1,3,5). The literature has seen many reports of these success stories, although mainly from academic medical centers. Our current study demonstrates the effectiveness of CDSS in decreasing telemetry overuse in a community teaching hospital setting. Every hospital has a unique composition of patients, personnel, and resources. Although it is beneficial to adopt methods from other organizations, each hospital must ultimately tailor its own telemetry protocols to fit its needs.

Methods

An analysis of data for patients on telemetry was conducted during the period of January 2018 to July 2018 (6 months pre-implementation) and 12 months after the launch of the electronic alert (post-implementation) between August 2018 and July 2019. This analysis was conducted for each of the four data sets: 1) patients managed by residents with telemetry used >2 days, 2) patients managed by residents with any telemetry, 3) patients managed by all physicians with telemetry used >2 days, and 4) patients managed by all physicians with any telemetry. We excluded patients in the intensive care unit, emergency department, operating room, pacs, and step down unit. We also excluded patients with DRGs for which telemetry was indicated according to recommendations from the ACC/AHA guidelines. During this period, a total of 24,276 patient hospitalizations were reviewed: 14,347 patients in 2018 and 9,929 patients in 2019.

Conclusions

The implementation of a passive electronic alert built into the EMR system reduced the overall rate of telemetry overuse at our institution by 6% between the two time periods that we studied. Telemetry use rates in patients managed by residents only reduced by 22% in this period, suggesting an added educational value in our alert system. Although the protocol was not strict on documenting indications for telemetry, the ordering physicians were forced to continuously re-evaluate their own use of telemetry. This contributed to the overall reduction in overuse. This may also forebode of an even greater reduction in overuse once the active phase of the protocol begins. The active phase will no longer allow clinicians to ignore the telemetry alert, but it will also not restrict clinicians to a limited number of telemetry indications drawn from the ACC/AHA guidelines.

There are a number of benefits to the implementation of a dual-phase protocol. This protocol holds true even in any field beyond that of telemetry use. The early weeks of a passive phase allow for a grace period in which physicians can slowly adapt to a new electronic format without compromising patient care and safety. In addition, this initial phase allows adequate time for troubleshooting as well as physician and provider feedback for program improvement.

It is important to note that the decision to order telemetry within our hospital’s protocol rested on the admitting/hospitalist physician. There are reported models in which telemetry management was either left to a designated team of physicians and nurses, or to a collaboration between the hospitalist and a telemetry director. Utilizing CDSS alleviates the allocation of resources toward the delegation of a telemetry team or telemetry managers. However, the disadvantage is having to change the workflow for all admitting physicians practicing at our hospital as a whole.

Limitations and Future Directions

The limitations of this report include the short follow-up period of 12 months. From our time-bound analysis, we will be unable to demonstrate if this reduction in telemetry overuse can persist into the active implementation phase or even beyond. Another limitation is the setting of a single center study in a community teaching hospital. At our institution, the physicians practicing at the hospital are not employed by the hospital, and this had its challenges when we were rolling out our pilot and initiating change. Also, unlike some academic centers, our institution has not had repeated efforts at telemetry overuse reduction. Given that every hospital has its unique composition of resources and patients, the applicability of our telemetry protocol to other hospitals has its limits as well.

Although CDSS is a powerful tool for guiding changes in practice, the limitations of CDSS itself cannot be ignored. Similar to telemetry alert fatigue, there can be electronic alert fatigue which can affect clinician response. The fact that the alerts pop-up on the center of the screen at the very moment the clinical decision is made can actually disrupt the workflow of clinicians. This may explain the slight increase in telemetry usage rates a few months post-implementation. One possible solution is to place the telemetry alerts in a side-bar or “to-do-list” much like the current EHR’s documentation query system, but further exploration is needed.

An important factor to keep in mind moving forward is not to compromise patient care or safety with these changes. Future studies can look at the changes in volume of emergency codes and rapid responses with lower rates of telemetry use. Along the same vein, patient satisfaction can also be studied as it may be influenced by excessive telemetry use.

Results

Table: Change in mean rates of telemetry use

<table>
<thead>
<tr>
<th>Method</th>
<th>All patients</th>
<th>Only patients with telemetry used for &gt;2 days</th>
<th>All patients managed by residents only</th>
<th>Patients with telemetry used for &gt;2 days and managed by residents only</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-launch</td>
<td>34%</td>
<td>15%</td>
<td>53%</td>
<td>19%</td>
</tr>
<tr>
<td>Post-launch (Jan. 2018 - July 2019)</td>
<td>28%</td>
<td>10%</td>
<td>31%</td>
<td>9%</td>
</tr>
<tr>
<td>Difference</td>
<td>P&lt;0.001</td>
<td>P&lt;0.001</td>
<td>P&lt;0.001</td>
<td>P&lt;0.001</td>
</tr>
</tbody>
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Bibliography