EFFECT OF A PROCESS IMPROVEMENT INTERVENTION ON INPATIENT TELEMETRY UTILIZATION INITIATED IN THE EMERGENCY DEPARTMENT

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BACKGROUND
- Inpatient telemetry monitoring is costly and overutilized.
- Has only limited benefits for most non-ICU patients.
- Optimizing utilization of telemetry for admitted patients may result in cost savings, increased efficiency (such as ED throughput time).

OBJECTIVE
- To optimize telemetry ordering by emergency medicine (EM) residents.
- Endpoints:
  - A reduction in overall telemetry utilization
  - A simultaneous improvement in "appropriate" utilization

METHODS
- This project assesses the impact of a modified rapid cycle process redesign using Six-Sigma methodology (led by a 'Black-Belt') to optimize telemetry utilization initiated in the ED.
- January 1, 2010 and April 14, 2010
- Single, academic, urban ED with over 65,000 visits per year.
- 48 EM residents PGY 1-4
- Part of larger hospital-wide high level group of both front-line workers (i.e., physicians, nurses) as well as senior level hospital leadership with a goal to reduce overall hospital telemetry utilization.
- Residents received:
  - A simple educational tool (pocket card)
  - A brief review of the available evidence-based guidelines for telemetry monitoring.
- Criteria for appropriateness determined based on American College of Cardiology guidelines.
- Joint effort by internal medicine, cardiology, EM.
- 100 randomly selected patient charts reviewed from all ED patients in both specified two week study periods.
- Compared the proportion of ED patients admitted to telemetry during a study period before and after the process improvement.
- Then compared the proportion of inappropriate telemetry orders placed by EM residents during the two study periods by reviewing 100 randomly selected medical records of patients admitted to non-ICU telemetry beds.
- Cases were scored "appropriate" or "inappropriate" based on the consensus guidelines.
- If the telemetry diagnosis was in question, the entire ED chart was reviewed for other telemetry indications.
- A second reviewer blinded to the study period reviewed 20% of the charts to determine inter-rater agreement of "appropriateness" evaluation.
- A Chi-square (X^2) test was used to test for differences between the two groups (before and after the process improvement).

RESULTS
- Total ED volume was comparable during the two study periods.
- 48.1% of ED admissions were to telemetry beds before the process improvement compared to 38.0% after (X^2 = 16.14, p < 0.001).
- Compared to the control period, the proportion of inappropriate telemetry orders placed by EM residents was reduced from 23.0% to 9.0% after the process improvement (X^2 = 7.29, p < 0.01).
- Inter-rater agreement was 100%.
- Incidentally, it was noted that ED boarding of patients waiting for telemetry beds was completely eliminated in the post-intervention time period.

CONCLUSIONS
- A targeted intervention to reduce telemetry utilization in conjunction with a hospital wide process improvement is associated with reduced inpatient telemetry utilization initiated by EM residents.
- Monitoring of data to determine if these trends persist is ongoing.
- Future research should investigate the potential impact of decreased telemetry utilization on measures of ED crowding and patient flow such as length of stay and rates of hospital diversion.

REFERENCES