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An Updated Rounds Checklist to Increase Appropriate Use of Telemetry Monitoring

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An Updated Rounds Checklist to Increase Appropriate Use of Telemetry Monitoring

By

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This Capstone Project has been examined and approved.

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ABSTRACT

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Background: Telemetry monitoring is an essential tool to monitor cardiac electrical activity. Its overuse is costly in time and resources and leads to subsequent testing and treatments that are not necessary for the patient and, in addition, healthcare staff is burdened with work that is potentially not clinically useful.

Aim: The global aim of increasing efficiency in telemetry use starts with the local improvement to facilitate nurse-physician communication of telemetry patients during

Methods: This study with pre and post data collection looked at the results of quantitative data, collected in May-July 2015, on the number of patients with telemetry and the corresponding clinical indication before and after implementation of a modified rounds checklist which included telemetry as a discussion point. The new checklist was initiated on June 22, 2015 and post intervention data was gathered to determine if there was a decrease in the overuse of and increase in the appropriate use of telemetry.

Results: With the implementation of the checklist the use of telemetry decreased, however the clinical indication for use did not improve.

Conclusion and implications for CNL practice: After the implementation of the checklist criteria there has been a consistent decrease in telemetry use. This may attributable to improve nurse-physician communication, however, there is still a lack of appropriate clinical indication of use and the CNL, as lateral integrator, in future

improvement projects, should support further modifications to the clinical indication set to improve appropriateness of telemetry use.

Keywords: *telemetry, telemetry indications, telemetry guidelines, telemetry discharge, nurse's role in telemetry monitoring, nurse-physician communication, rounding checklist, nurse-physician collaboration*

INTRODUCTION

An Updated Rounds Checklist to Increase Appropriate Use of Telemetry Monitoring

Background Knowledge: Nurse Telemetry Monitoring

Cardiac telemetry is the remote monitoring system that is used to detect and record the electrical cardiac activity of patients. Electrodes are attached to the patient's chest and cardiac activity is recorded for typically no less than 24 hours to detect any significant physiologic or life-threatening changes in a timely manner (Radtke, 2008). In a hospital setting it is a useful and noninvasive way for healthcare professionals to identify cardiac arrhythmias, ischemia, assess pacemaker functionality, determine heart rate variability, and provide continuous supervision of a patients cardiac rhythm during routine activity. This ambulatory heart monitoring method is one of the most effective tools for diagnosing and assessing either abnormal cardiac rhythm, identify risk stratification of diverse cardiac patients, and monitor silent ischemia (Podrid, 2015).

There are many reasons for the implementation of telemetry. Telemetric heart monitoring is particularly useful to assess patients with cardiac arrhythmias including patients with heart disease, "hypertrophic and dilated cardiomyopathy… and symptomatic patients with hemodynamically unstable ventricular tachycardia or ventricular fibrillation resulting in sudden death" (Podrid, 2015, http://www.uptodate.com.libproxy.unh.edu/).

Cardiac arrhythmias often follow the existence of a cardiac substrate (commonly a ventricular myocardium structural abnormality), electrical triggers, and the existence of pathophysiologic modulating factors which may compromise the functionality of the cardiac substrate or alter the occurrence of the electrical triggers such as "ischemia, electrolyte imbalance, pH changes, changes in sympathetic or parasympathetic neural

tone, circulating catecholamines and other neurohumoral factors, and drugs" (Podrid, 2015, http://www.uptodate.com.libproxy.unh.edu/).

The American Heart Association in 2004 provided recommendations to guide the use of telemetry. Three classes were established: Class I: telemetry is indicated in most, if not all, patients in this group, Class II: telemetry may be of benefit in some patients but is not considered essential for all patients, and Class III: telemetry is not indicated because a patient's risk of a serious event is so low that monitoring has no therapeutic benefit. These classes are further broken down into indications of use that apply to medical surgical patients. See Table 1 for examples:

Table 1: *Some examples of indications for telemetry use*
Mobitz I or II second degree heart block
New-onset bundle-branch block
Long-QT syndrome and associated ventricular arrhythmias
Acute heart failure/pulmonary edema
Hemodynamically unstable arrhythmia especially with underlying cardiac disease (critical aortic stenosis, hypertrophic cardiomyopathy)
Sub acute heart failure
Severe electrolyte imbalance
Administration of an anti-arrhythmic drug known to cause *torsades de pointes*
Patients in early phase of acute coronary syndrome (STEMI, NSTEMI, MI, UA, Or "Rule-out" MI
Stroke
Syncope
Wolff-Parkinson-White syndrome and another arrhythmia (such as atrial fibrillation)

Table 1. Some examples of indications for telemetry use, (Drew et al, 2004)

Equally important to appropriateness of use of telemetry are reasons to discontinue telemetry. Some examples may include those found in Table 2.

Table 2. *Some examples of exclusion or discontinuation criteria*
Clinical stabilization of acute decompensated heart failure
Stabilization or resolution of arrhythmias by medical therapy or device (pacemaker or AICD)
Negative cardiac enzymes and a negative stress test in patients with chest pain and low or intermediate probability for angina
No further chest pain in patients who have uncomplicated MI who have been under observation for 2-4 days post-MI
Absence of arrhythmias after 48 hours of monitoring in patients with syncope or suspected arrhythmias
24 hours post-insertion of a permanent pacemaker if there were no device problems and post-implantation of device is complete

Table 2. Some examples of exclusion or discontinuation criteria, (Dhillon, 2009, p.126)

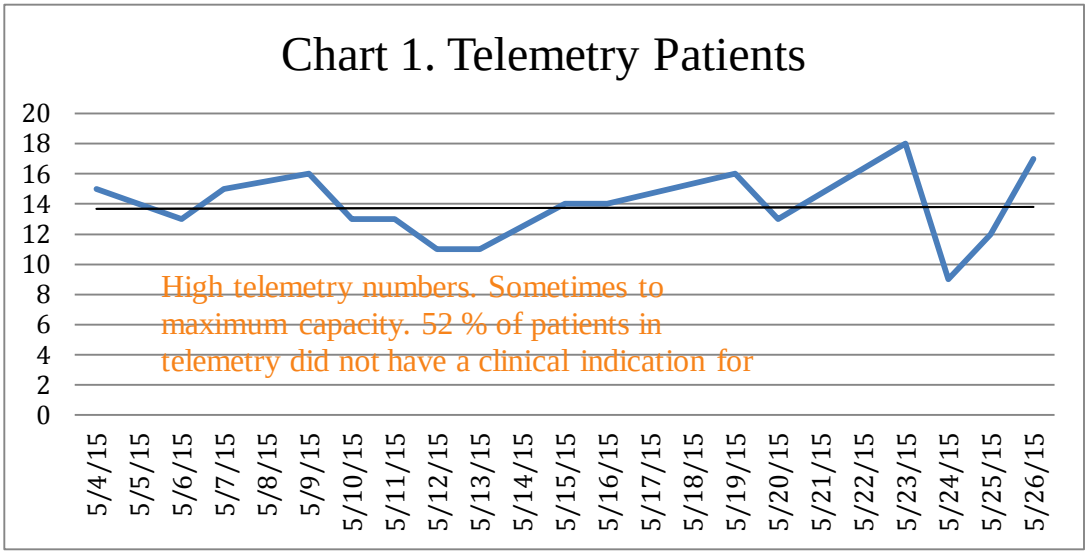
Global problem

Cardiovascular disease is the leading cause of death; therefore the appropriate identification of those patients who require telemetry monitoring while hospitalized is vital (CDC, 2015). One aim for improvement of healthcare delivery in the Institute of Medicine's 2001 report is efficiency of care. Efficient care means resources are not wasted, supplies are not misappropriated, and energy is not spent needlessly (IOM, 2001). With the global goal of efficiency for this project, the waste of resources can be

minimized (IOM, 2001) and with increased efficiency comes care that is better focused on the needs of the patient, resources are used for the best clinical result, and outcomes improve.

Local Problem

One improvement to the use of telemetry at the site of this quality improvement project was to better identify patients within the microsystem who would benefit from its use and to reduce its use for those patients who had no clinical indications. Chart 1 shows the average number of telemetry patients was close to 14 and almost at full capacity (16 total telemetry patients possible for the unit). A chart review was done of 29 patients on telemetry. Of these 29 telemetry patients, 15 (52%) did not have a clinical indication supporting its use between 5/4/15 and 5/26/15.



Telemetry cardiac monitoring is a vital part of continuous assessment of patients at risk for cardiac dysrhythmias. Physicians order its use and nurses assess the output of

each patient's telemetry readings on their shift to detect any complications or unusual events to minimize adverse patient outcomes. The nurse's role is to assess the heart rhythms present, the results of which are then used as an integral part of assessing the physiologic status of the individual. Nurses also need to access the health records to find any relevant facts (Radtke, 2008) that may indicate a change in status of telemetry. This information is best communicated to the physician during rounds in order to address any nursing concerns about the patient's change in need of telemetry. Currently there is an interdisciplinary rounds checklist that guides communication that includes central lines, fall risk, and catheters. Telemetry is not often discussed. There may be instances when the patient has stabilized, the necessity of the telemetry order may be in question, or discontinuation of telemetry is indicated.

A major deterrent to efficiency in this microsystem is the lack of communication about telemetry patients between nurses and providers during rounds. A survey (APPENDIX A) to determine what nurses perceive as areas in need of improvement related to lack of efficiency in telemetry monitoring was conducted. 17 full-time day shift nurses were surveyed over the course of approximately one workweek, 11 surveys were completed resulting in a response rate of 65%. The results of the pre-intervention survey, displayed in Table 3, indicated that 100% of nurses felt that clearer telemetry guidelines on the rounds checklist would help to facilitate communication with physicians. Of the nurses surveyed, 82% would find it helpful to communicate with the physician regarding telemetry discontinuation, but 73% thought that the guidelines were not clear for

discontinuation. The majority of nurses (91%) were aware that the order for telemetry automatically expires in 72 hours, but the majority (91%) did not feel comfortable discontinuing the order with communication with the physician. The results of the survey indicate that communication between nurses and physicians about telemetry patients is lacking on the unit.

TABLE 3: Pre-intervention survey results

Table 3. Nurse Survey: Pre-Intervention	Response: Yes	Response: No
In your clinical judgment, do you have patients on telemetry who no longer require it?	64%	36%
Have you cared for patients where you were not sure if the initial order for telemetry was still applicable?	55%	45%
Would you find it helpful to communicate with the physician regarding telemetry discontinuation?	82%	18%
Do you feel comfortable discussing the discontinuation/status of telemetry with the physician?	73%	17%
Are you satisfied with the method of communication that exists currently to discuss telemetry discontinuation?	64%	36%
Are the guidelines clear as to the need for telemetry?	18%	82%
Are the guidelines clear as to the discontinuation of telemetry?	27%	73%
Would clearer guidelines for telemetry help facilitate your comfort in communicating with physicians?	100%	0%
Are you aware that the order for telemetry automatically expires in 72 hours?	91%	9%

Do you feel comfortable discontinuing the telemetry monitoring after 72 hours on your own without communication with the physician?	9%	91%

There is evidence that interprofessional collaboration (IPC), the process wherein

diverse professionals come together, communicate effectively, share goals, and ultimately improve the health care delivered via this cooperative strategy (Zwarenstein, 2009) not only can make care more efficient, but also lead to improved outcomes. Carbo and Folcarelli, suggest that nurses and physicians can communicate well only if they speak to one another (Carbo, 2015). Remote communication can lead to errors in understanding, increase the time needed to execute orders, and stalls initiation of orders (PNC, 2008). There is a need for communication and a workflow that supports this helps to ensure constant improvements in interprofessional communication and collaboration (PNC, 2008).

As partners in the care of telemetry patients, nurses and physicians must collaborate and communicate about any status changes, change in indications, or any other clinically relevant information to provide optimal care. In healthcare units when various professionals work collaboratively, coordinate the care they provide, and come to professional and clinical conclusions, that are cohesive, care is better. Hospital settings where diverse healthcare professionals run into “problematic power dynamics, poor communication patterns, lack of understanding of one’s own and others’ roles and responsibilities, and conflicts due to varied approaches to patient care” (Zwarenstein, 2009, p.2) complicate care management and this can have negative effects of the care the patient receives set as delays in care, inappropriate care delivery, or even clinically unnecessary testing.

LITERATUREVIEW

A review of the literature was conducted to appraise the role of nurses and nurse-physician communication in telemetric cardiac monitoring. Many search terms and delimiters were used in the Cumulative Index for Nursing and Allied Health Literature (CINAHL), PUBMED, and WEB of SCIENCE databases at the Dartmouth Biomedical libraries with the following search parameters: full text available, English-only, adults over 18, and published between the years 2005-2010. The key phrases used were: (a) “telemetry” with four hundred and six results found; (b)“telemetry” and (c) “cardiac” and (d)”nursing role” with twelve results found; (e)”nurse” and (f)“decision” with five results found; (e)”nurse” and (f)“decision” and ”telemetry” with nine results found; (g)“telemetry” and (h)”communication” six articles were found articles; (i)“telemetry” and (j)“interprofessional” with seven results found; (k) “telemetry” and (l) “nurse physician communication” with two results found; (m) “telemetry” and (n) “interprofessional” with seven results found. After review and consideration of the articles retrieved, three articles had relevant subject matter and compelling evidence that addressed whether or not the implementation of an interdisciplinary effort such as IPC would be beneficial in improving efforts to ameliorate the appropriate use of telemetry on the unit. Though the articles reviewed did not describe initiatives based on telemetry, their results are applicable to this microsystem and have implications that point towards the benefit of using an IPC initiative in this organization to improve care.

The first article was a Cochrane review of randomized control trials that were centered on practice-based interventions that interprofessional collaboration (IPC) to determine how IPC effects the quality of care. This review was an example of level I evidence (JHNEBP, 2015). The assumption is that poor IPC has a negative impact on the way care is delivered and that an increase in collaboration among professionals caring for and following a patient is of benefit and improves the healthcare outcomes and patient satisfaction. Specifically, the studies in this review compared the impact of IPC and to no intervention or an intervention that was not IPC-centered. An additional consideration was the "degree of IPC achieved" (Zwarenstein, 2009). A meta-analysis was not done due to the small numbers of studies, but this review serves as a comprehensive summary of RTCs that are related to this subject.

Of the five studies that were included, two investigated interprofessional rounds, two interprofessional studies, and the last "examined externally facilitated interprofessional audit" (Zwarenstein, 2009). The results of one of the studies on interdisciplinary rounds, done in an inpatient medical unit at a hospital, showed a positive impact on length of stay and cost of care. The second study on interdisciplinary rounds found that IPC made no change in the length that patients were in the hospital. "Monthly multidisciplinary team meetings improved prescribing of psychotropic drugs in nursing homes" (Zwarenstein, 2009, p.2). Of particular note was that "multidisciplinary meetings with an external facilitator, who used strategies to encourage collaborative working, was associated with increased audit activity and reported improvements to care" (Zwarenstein, 2009, p.2). The limitations of this review include the fact that the small number of studies

were reviewed were small, sample sizes were also small, and there were many differences in the interventions used making the findings difficult to draw generalizable conclusions about.

In a literature review Tang, Chan, Zhou & Liaw (2013) investigated how the attitudes on collaboration that were held by nurses and physicians, factors effect collaboration, and methods to improve this collaboration. This review is an example of Level 3A evidence that incorporated 17 reviewed studies in the review (JHNEBP,"2015).

This study presented evidence that both nurses and physicians value collaboration and see it as a vital aspect of care that improves outcomes and patient satisfaction (Tang, et al 2013). However, in the four studies reviewed, it was found that the lack of physician presence on the unit (Tang) negatively impacted communication and collaboration between nurses and physicians. Further, it was also found that physicians more frequently assess the status of their patients with lab values and objective findings while nurses frequently incorporate their intuitive observations (Tang). Limitations of this review include that the all of the relevant literature may not have been identified and some of the articles reviewed had small samples sizes and the methodological approaches could have resulted in bias (Tang).

In a systematic review Petri (2010) analyzed the current use of interdisciplinary collaboration in healthcare and is a level 2b qualitative study (JHNEBP, 2015). Nurse – physician collaboration is a process that required the professionals involved to have "shared objectives, decision-making, responsibility, and power working together" (Petri,

2010, p.79) Petri noted that support for this process by the organization within which these professionals work is a key component to its success and the effects of its success positively impact the organization, the professionals who work there, and ultimately the patient (Petri, 2010). One limitation to this study is that the definition of interprofessional collaboration varies from study to study and therefore the conclusions are not homogenized and not necessarily reflective of one unified concept. The recommendation would be to formalize what interprofessional collaboration is and have a universal understanding to as to be able to more effectively analyze its effect and impact on healthcare.

The purpose of a descriptive study by Benham-Hutchins & Effken (2010), was to learn more about how professionals in healthcare communicate. This study is representative of evidence level 3c (JHNEBP, 2015) with limitations that include limited generalizability due to its small size and the participation of the providers was not consistent in all aspects of the data collected.

In the study, a convenience sample was used and it was determined that the establishment of a common ground is fundamental to effective communication and therefore collaboration. Though verbal communication is important, collaboration is even further improved more structure supports like procedural policy, workflow design, and coordination of care adds to the efficacy of collaboration (Benham-Hutchins, 2010). This supports the use of an interdisciplinary rounds checklist. This checklist is a procedural tool that reflects the organizations value for nurse-physician collaboration and serves as a tool to make it easier.

Finally, in a study set in a 45-bed medical unit, a 4-week pilot program was launched to implement collaboration between nurses and physicians while rounding to improve patient outcomes (Burns, 2011) that included bedside reporting. This study was appraised as a Level3c piece of evidence. Limitations included the small size of the data sample, the data was collected on a small portion of the hospital unit, the sample size was not well-described, and the data used for the pilot program was grouped with other units data making it difficult to translate. The study results suggest that nurse-physician rounding allowed for questions to be answered that would otherwise have needed to be asked via paging (Burns, 2011). The initiation of the rounding met with some resistance and staff needed to be reminded to comply with the process, and nurse leaders had to accept the need for coaching and follow-up, but it was found that care became more efficient and fewer reminders were needed as the new rounds process was acculturated in the unit.

Summary of the Evidence

The evidence supports that increased communication and collaboration between physicians and nurses leads to more comprehensive care and better patient outcomes. The modification of the rounds checklist to include telemetry increases the opportunity for nurses and physicians to communication. This opportunity may allow for increased collaboration and lead to the improved appropriateness of telemetry use. With the initiation of the modified checklist, a communication tool, the appropriateness of telemetry should increase thereby improving efficiency of this aspect of acute care

surveillance. This difference in approach can lead to increased communication difficulties that may be mitigated by the use of a rounds checklist to provide specific topics to cover.

GLOBAL AIM

The global aim of this quality improvement project was to improve the efficiency of telemetry use on a medical specialties unit.

SPECIFIC AIM

The specific aim of this project was to modify an existing interdisciplinary checklist to include "telemetry" and additional information on indications for telemetry as an improvement tool, to increase interdisciplinary collaboration (IPC) and communication during the sometimes time-limited rounds discussions that nurses and physicians have. The goal of this project was to decrease the number of telemetry patients who do not have an indication to support it use by 7/2015.

METHODS

Setting

The site of this quality improvement project was a New England Hospital's medical specialties unit (MSU) comprised of three floors. Specialty services include cystic fibrosis care, wound care, dialysis, and telemetry. The patient capacity is ~60 patients with the majority between the ages of 47-85. The average stay is about 4 days. There are ~ 18 RNS, 2 nurse mangers, and LNAs as well as emergency support teams on call as needed and the nurse patient ratio is approximately 1:5 making the addition of telemetry a time-

consuming task especially if a nurse has more than one telemetry patient to care for. The telemetry must be monitored, an end of shift note documented on telemetry, and nurses need to return calls made by the telemetry technicians if an arrhythmia is detected. The maximum number of patients who can be monitored by telemetry is 16. This monitoring involves the bedside RN, telemetry technicians in a remote location, and a physician order.

Theoretical Framework for Change

This project incorporated the PDSA cycle theoretical framework for change to organize change sequence into predictable and logical steps. There are four phases in this process. The first step in this model of change is the “Plan” stage. A goal is determined and efforts made to understand the process and steps that can be made to reach that goal. Next, in the “Do” part of change, interventions are introduced and implemented to work towards the attainment of the goal. The “Study” steps is a period in this change cycle where the effects of the interventions are evaluated to determine of changes were made that were positive or negative; whether these interventions have met the objectives that are the foci of the achievement of the primary goal has to be determined. Last, the “Act” step is the period of the change cycle wherein learning is integrated the process evaluated, and adjustments can be made in the change process to plan further changes or identify different goals. This wheel is a continuous cycle and change can be made in continuous cycles until the initial goal is reached (WEDI, 2015).

This framework allows for continuous improvements and testing of those improvements to gauge their effectiveness in achieving the project's aim. This allows for projects to continue momentum and future improvements can be pursued with the change cycle "wheel" (IHI, 2015).

Intended Improvement

During the initial planning, evidence was collected that indicated telemetry use is not often clinically appropriate and noted that nurses and physicians do not have a formal opportunity to communicate in regards to the use of telemetry patients. A subsequent improvement, on June 22, 2015, instituted updates to that rounds checklist (APPENDIX B) that included telemetry to be used to support nurse-physician communication during rounds. Introducing a new checklist item has the potential to facilitate IPC and encourage effective collaboration between nurses and physicians to improve the efficient use of telemetry. The bedside nurse, with a close view of the patient and more focused knowledge of the patient's recent status, may be well prepared to provide clinical evidence to support the exclusion of telemetry and/or its discontinuation. Specifically, this tool can ensure that the nurse and provider interact and share vital health information related to their shared telemetry patients "for the explicit purpose of improving interprofessional collaboration and/or the health/well-being of patients/ clients" (Zwarenstein, 2009, p.2) while improving efficiency of telemetry use. A list of inclusion criteria will also be added to the checklist to further assist nurses to communicate with providers. Though there is a standing order for the automatic discontinuation after 72 hours if the order is not renewed, nurses do not discontinue the telemetry without discussing this with the physician,

likewise 48 hours of cardiac stability is also grounds for discontinuation, but nurses must communicate by page or email and receive the permission of the physician to do so; these are two examples of information that can be shared during rounds in a timely manner when prompted by the checklist item thereby improving efficiency.

The checklist modification is an improvement step that has the potential to improve this cardiac monitoring process and the evidence supports that improving communication and collaboration has the potential to improve care. Processes (technological, infection control, procedural, and behavioral) exist for organized quality of care on the unit, and patterns exist in this microsystem to facilitate that quality and ensure safety of patients, but the time that nurses and physicians have to discuss telemetry patients face-to-face during rounds needs to be optimized to improve efficacy in its use.

This change is an essential one to improve the use of telemetry, however, the underlining goal of increasing nurse-physician communication and collaboration will have lasting effects of the quality of care that all patients receive on the unit. By establishing a checklist to be used by physicians and nurse in morning rounds, will provide the opportunity for the care team to work more effectively not just on telemetry, but may have lasting effects on the quality and frequency of communication between nurses and physicians in the future.

DATA ANALYSIS

The data analysis plan for this project is two-fold. The first step is to compare the outcome measures of the total number of telemetry patients and number of telemetry patients without indication to determine statistical inferences or conclusions as to whether

appropriateness of telemetry increased. A t-test analysis was used to determine if the frequency of telemetry use before and after the intervention has the significant possibility of being the result of the intervention or simply the result of chance.

The second part of the data analysis plan is to look at the process measure of increased communication using descriptive quantitative data related to the pre and post-intervention nurse surveys to determine whether inferences can be drawn and generalizations made about if and how the modified checklist changed the rounds process.

RESULTS

After the intervention, a survey (APPENDIX C) was conducted to determine perceptions of nurses on the updated checklist and whether it improved communication and efficiency. 18 full-time day shift nurses were surveyed over the course of approximately one workweek, 11 were completed resulting in a response rate of 65%. The results are displayed in Table 4.

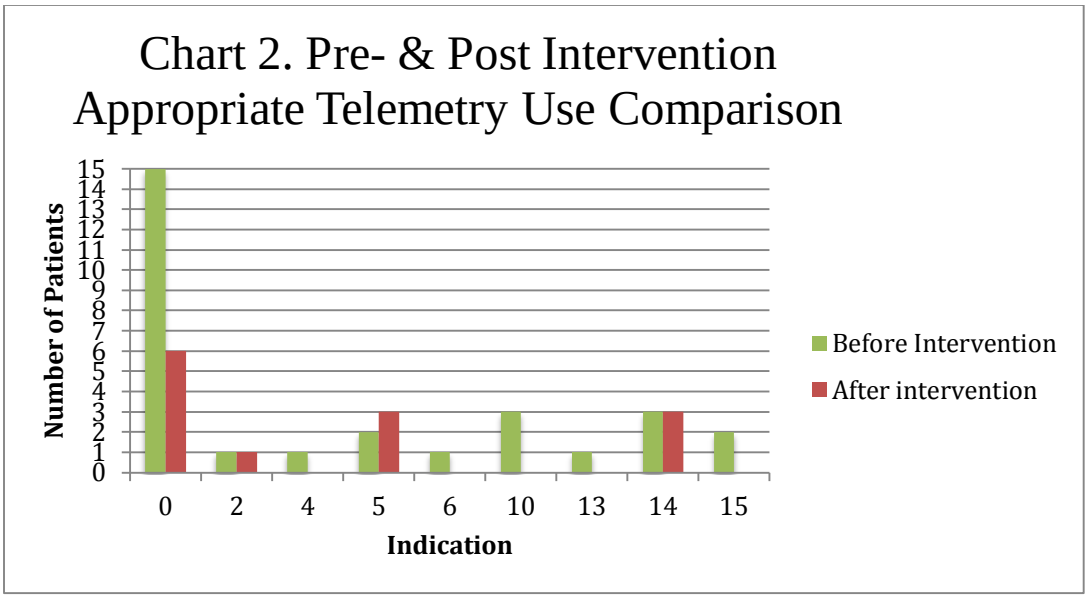
TABLE 4. Post-intervention survey results

Table 4. Nurse Survey: Post-Intervention	Response: Yes	Response: No
After the initiation of the new HAC checklist, do you have fewer patients on telemetry?	100%	0%

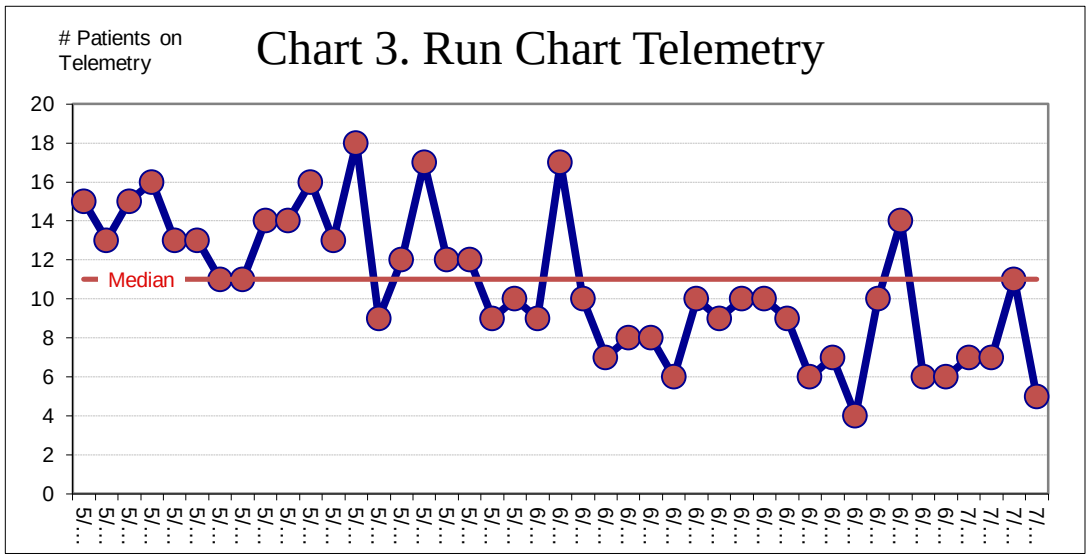
If yes, can you attribute that ti the new checklist?	55%	18%
Did the interdisciplinary checklist provide more opportunity to communicate with physicians?	82%	18
Did the new interdisciplinary checklist make collaboration with physicians on telemetry patients easier (i.e. discontinuation, sharing status, etc.)?	55%	45%
Did the interdisciplinary checklist help facilitate more timely D/C of patients from telemetry?	0%	100%
Are the guidelines on the checklist helpful when communicating with physicians?	64%	36%

Of the nurses surveyed, 100% reported having less telemetry patients after the checklist was initiated, but only 55% attributed that to the checklist. Of the nurses surveyed, 82% felt that the checklist provided an opportunity to communicate and 55% thought that it increased collaboration with physicians.

None of the nurses reported that the checklist helped facilitate timelier discontinuation of telemetry, however 64% of nurses felt that the guidelines on the checklist were helpful when communicating with physicians about telemetry patients.



A comparison of the pre and post intervention data on telemetry demonstrated that the average number of patients on telemetry dropped from 9.2 to 4.



This run chart shows a trend of decreased use over the three-month improvement project (Chart 3). A t-test was performed with a score of 1.431783-05 (p-value =

0.002611) indicating with statistical significance that the results were not the result of chance. A second chart review was done of 12 of the telemetry patients during the post intervention period and of the 12 patients on telemetry 6 (50%) did not have a clinical indication supporting its use between 6/22/15 and 7/14/15. This 2% decreases in the number of patients on telemetry without indication showed improvement in appropriate use and the survey results indicate that the guidelines on the checklist facilitated communication of telemetry during rounds.

The checklist facilitated collaboration and improved nurse-physician communication. Overall the nurses reported having fewer patients on telemetry without indication. Most nurses reported that the checklist did not help facilitate timelier discontinuation but did feel that the updated checklist facilitated IPC during rounds. Many nurses reported that the checklist the decreased number of telemetry patients was the result of several coexisting improvements and could not be attributed to the checklist exclusively.

DISCUSSION

The results of this project based on the survey results suggest that the modified checklist is a helpful addition to facilitate communication and in the future, further efforts to support nurse-physician collaboration would be beneficial to increase collaboration to improve care. The results indicate an improvement in the appropriate use of telemetry. The survey results suggest that the checklist was at least modestly helpful, but the improvement in use cannot be attributed to this improvement alone. The modification of the checklist improved the communication nurses had with physicians and the workflow

design changed supported increased collaboration (Benham-Hutchins & Effken, 2010) Improved nurse-physician communication was supported by introduction of the modified checklist and made the "objectives, decision-making responsibility, and [the] power of working together" collaborative (Petri, 2010, p.79). The opportunity for nurses and physicians to discuss shared patients and particular aspects of care helps ensure that care is more efficient and appropriate. Lastly, the checklist helps to ensure that nurses and physicians have a change to speak to one another and minimizes errors in understanding and may help to expedite initiation of changes of treatment plans (PNC, 2008).

Limitations

There are several limitations to this study. First, the generalizability of these findings to other acute setting units is limited due to the fact that it was implemented on only a medical unit. Further, the implementation of the modified checklist and the trend in decreased telemetry use and increase in appropriateness of use cannot be established as the only explanation for improvement. This trend is likely the result of several coexisting improvement initiatives and greater awareness of the need to improve the appropriateness of telemetry use organization-wide.

Nonetheless, the results of the post survey of nurses do suggest that the checklist has contributed positively to this process and has helped facilitate IPC on the unit. The 2% increase in appropriateness of use is a positive change and to increase this trend the indications for telemetry use are going to be updated to better reflect the patient population in the unit. These improvements will likely continue to support the

appropriateness of telemetry use.

It is not possible to separate out this improvement cycle as the sole explanation for increased appropriateness of use, subsequent PDSA cycles would be helpful to continue the improvement process trajectory and future evaluation would be helpful to determine whether there is a sustained impact on IPC. Future methods to improve IPC through workflow design modifications to improve IPC should be considered. Awareness has been raised of the importance of nurse physician collaboration.

CONCLUSIONS

Locally, this improvement in the communication process has the potential to shed light on other areas where communication can be improved and possible additional items to include in the checklist. The organizations goal to improve surveillance may also find that a focus on nurse-physician communication is a vital component to examine.

Implications for CNL Practice

With the implementation of the checklist criteria and unit-wide initiatives to improve the appropriateness of telemetry use, the CNL has future responsibilities in this unit. While this project may have begun to improve nurse-physician communication, assessment of this microsystem showed a lack of collaboration of nurse and physicians. The role of the CNL is to work with diverse professionals and lead initiatives that improve care outcomes such as improvements in nurse-physician collaboration. Additionally, there is still a lack of appropriate clinical indication of use (50%) and the CNL in future improvement projects must be "accountable for the ongoing acquisition of knowledge and

skills to effect change in health care practice and outcomes and in the profession" (AACN, 2007, p.13) by supporting further improvement projects. The CNL has the responsibility and skill set to analyze existing data, assess barriers, and implement changes that continue to support the appropriate use of telemetry.

APPENDICES

Appendix A: Pre-Intervention Nurse Survey

SURVEY QUESTIONS:

1. In your clinical judgment, do you have patients on telemetry who no longer require it? Yes or No

2. Have you cared for patients where you were not sure if the initial order for telemetry was still applicable?
Yes or No

3. Would you find it helpful to communicate with the physician regarding telemetry discontinuation?
Yes or No

4. Do you feel comfortable discussing the discontinuation/status of telemetry with the physician?
Yes or No

5. Are you satisfied with the method of communication that exists currently to discuss telemetry discontinuation?
Yes or No

6. Are the guidelines clear as to the need for telemetry?
Yes or No

7. Are the guidelines clear as to the discontinuation of telemetry?
Yes or No

8. Would clearer guidelines for telemetry help facilitate your comfort in communicating with physicians?
Yes or No

9. Are you aware that the order for telemetry automatically expires in 72 hours?
Yes or No

10. Do you feel comfortable discontinuing the telemetry monitoring after 72 hours on your own without communication with the physician?
Yes or No

APPENDIX B: Updated Interdisciplinary Rounds Checklist

Indications for a Foley:

- Acute Urinary Retention
- Bladder Outlet Obstruction
- Incontinence in patient with sacral or pressure ulcer

Interdisciplinary Rounds Checklist:

- ☐ **Plan of the Day**
- ☐ **Telemetry**
- ☐ **Foley Catheter**
- ☐ **Central Line**

Appendix C: Post-Intervention Nurse Survey

Medical Specialties is working towards improving the efficiency of telemetry. This survey is an *anonymous* set of questions. The results of this follow-up survey will be used to evaluate the usefulness of the interdisciplinary checklist in facilitating nurse-physician communication.

SURVEY QUESTIONS:

1. After the initiation of the new Interdisciplinary rounds checklist, do you have fewer patients on telemetry?
Yes or No

2. If yes, can you attribute that to the new checklist?
Yes or No

3. Did the interdisciplinary checklist provide more opportunity to communicate with physicians?
Yes or No

4. Did the new interdisciplinary checklist make collaboration with physicians on telemetry patients easier (i.e. discontinuation, sharing status, etc.)?
Yes or No

5. Did the interdisciplinary checklist help facilitate more timely discontinuation of patients from telemetry?
Yes or No

6. Are the guidelines on the checklist helpful when communicating with physicians?
Yes or No

REFERENCES

AACN. (February 2007). *White Paper on the Education and Role of the Clinical Nurse Leader*. 1-40.

Agency for Healthcare Quality and Research (AHQR). Plan-Do-Study-Act (PDSA) Cycle (April, 2013) Retrieved from https://innovations.ahrq.gov/qualitytools/plan-do-study-act-pdsa-cycle

Benham-Hutchins, M.M. & Effken. J. A. (2010). Multi-professional patterns and methods of communication during patient handoffs. *International Journal of Medical Informatics*. 79, 252-267.

Burns, K. (2011). Nurse-physician rounds: A collaborative approach to improving communication, efficiencies, and perception of care. *MEDSURG Nursing, 20(4),* 194-199.

Carlson School of Management at the University of Minnesota. (2003). Applying Complexity Science to Health and Healthcare. *Center for the Study of Healthcare Management*. Retrieved from http://c.ymcdn.com/sites/www.plexusinstitute.org/resource/collection/6528ED29-9907-4BC7-8D00 8DC907679FED/11261_Plexus_Summit_report_Health_Healthcare.pdf

Center for Disease Control and Prevention (CDC) (February, 2015). Deaths: final data for 2013. National Vital Statistics Report. Retrieved from http://www.cdc.gov/heartdisease/statistics.htm

Dhillon, S. K., Rachko, M., Hanon, S., Schweitzer, P., and Steven R. Bergmann, S. R. (2009). Telemetry Monitoring Guidelines for Efficient and Safe Delivery of Cardiac Rhythm Monitoring to Noncritical Hospital Inpatients. Critical Pathways in Cardiology, 8:125-126.

Drew, B. J., Chair; Califf, R. M., Funk, M., Kaufman, E. S., W. Krucoff, M. W., Laks, M. M., Macfarlane, P.W., Claire Sommargren, C., Swiryn, S.,Van Hare, G. F. (2004). Practice Standards for Electrocardiographic Monitoring in Hospital Settings: American Heart Association. *Circulation*.110:2721-2746. doi: 10.1161/01.CIR.0000145144.56673.59.

Institute for Healthcare Improvement (IHI). (2015). Science of Improvement: testing changes. Retrieved from http://www.ihi.org/

Institute of Medicine (IOM) (March, 2001). Shaping the Future for Health Crossing the Quality Chasm. 1-8. Retrieved from file:///Users/AnalysisParalysis/Downloads/reportbrief.pdf

JHNEBP Research Evidence Appraisal. (2015). Retrieved from http://www.nursingworld.org/DocumentVault/NursingPractice/Research-Toolkit/JHNEBP-Research-Evidence-Appraisal.pdf

Kenaszchuk, C., Rykhoff, M., Collins, L., McPhail, S., and van Soeren, M. (2011).

Positive and null effects of interprofessional education on attitudes toward interprofessional learning and collaboration. Advances in Health Science Education (2012) 17:651–669. doi 10.1007/s10459-011-9341-0

Massoud MR, Nielsen GA, Nolan K, Schall MW, Sevin C. (2006). *A Framework for Spread: From Local Improvements to System-Wide Change.* IHI Innovation Series white paper. Institute for Healthcare Improvement. Retrieved from http://www.ihi.org/resources/Pages/IHIWhitePapers/AFrameworkforSpreadWhitePaper.aspx.

Nelson, G. (February, 2005). Clinical Microsystems "The Place Where Patients, Families, and Clinical Teams Meet": Assessing, Diagnosing, and Treating Your Inpatient Unit. *Institute for Healthcare improvement*, 1-42.

Petri, L. (2010). Concept analysis of interdisciplinary collaboration. *Nursing Forum*, 45 (2), 73–82.

Podrid, P.J. (Mar 2015). Ambulatory monitoring in the assessment of cardiac arrhythmias. *UptoDate*. Retrieved from http://www.uptodate.com.libproxy.unh.edu/

Physician-Nurse Collaboration and Patient Safety Collaboration Between Physicians and Nurses: Essential to Patient Safety. (PNC). CRICO/RMF 26(2), 1-17.

Radtke, A. (December, 2008). Telemetry monitoring: a preferred solution for intermediate care: new treatment settings and philosophies ensure optimal resources for patients

and clinicians. *Nursing Management*. 52A-52D. Retrieved from http://eds.b.ebscohost.com.libproxy.unh.edu/.

Society of Hospital Medicine (SHM) (20015). Five Things Physicians and Patients Should Question. *Choosing Wisely*. Retrieved from www.choosingwisely.org.

Tang, C.J., Chan S.W., Zhou W.T. & Liaw, S.Y. (2013). Collaboration between hospital physicians and nurses: An integrated literature review. *International Nursing Review* 60, 291–302

The W. Edwards Deming Institute (WEDI) (2015). The PDSA Cycle. Retrieved from https://www.deming.org/theman/theories/pdsacycle

Won Yoo, J., Kim, S., Seol, H., Jung Kim, S., Miyoung Yang, J., Sang Ryu, W., Jae Min, T., Bum Choi,J., Kwon, M., and Nakagawa, S. (2013). Effects of an internal medicine floor interdisciplinary team on hospital and clinical outcomes of seniors with acute medical illness Japan Geriatrics Society, 13, 942-948. doi: 10.1111/ggi.12035

Zwarenstein M., Goldman J., Reeves S., (2009). Interprofessional collaboration: effects of practice-based interventions on professional practice and healthcare outcomes. *Cochrane Database of Systematic Reviews*. Issue 3. Art. No.: CD000072. DOI: 10.1002/14651858.CD000072.pub2