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REPORT: The Beat Stops Here: A Nurse-Driven Protocol to Manage Telemetry Orders

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The Beat Stops Here: A Nurse-Driven Protocol to Manage Telemetry Orders

By

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Doctor of Nursing Practice Final Scholarly Project

In Partial Fulfillment of the Requirements for the Degree

Doctor of Nursing Practice

Otterbein University

2020

DNP Final Scholarly Project Team:

Dr. Kirk Hummer, DNP, Advisor

Mrs. Patricia Lowe, MBA, BSN

Executive Summary

At a large midwestern healthcare organization, cardiac telemetry monitoring orders are not aligned with clinical guidelines developed by the American Heart Association (AHA). A nurse-driven protocol, based on AHA guidelines, to manage cardiac telemetry orders may reduce telemetry usage. Donabedian's quality improvement framework of structure-process-outcomes was utilized as the theorical framework for this project, with the purpose to reduce telemetry days within 30 days on a selected acute care unit utilizing AHA guidelines. Project objectives included developing an assessment tool based on AHA guidelines, educating pertinent stakeholders on the nurse assessment tool, and implementation of the tool on the chosen acute care unit for 30 days.

Pre- and post-implementation data that included the date telemetry was started and stopped were obtained from the organization's Central Monitoring Unit (CMU). Upon commencement of the implementation, submitted assessment tools were reviewed for completion accuracy and paired with post-implementation data provided by the CMU resulting in 14 patients with complete data for analysis. Data analysis indicates a potential 30.5% decrease in telemetry monitored days and a potential savings of over $2 million annually to the identified healthcare organization.

The Beat Stops Here: A Nurse-Driven Protocol to Manage Telemetry Orders

Introduction

Identify the Clinical Problem

Wide variation was observed in cardiac telemetry monitoring within a large midwestern healthcare organization due to lack of alignment with clinical guidelines developed by the AHA and the electronic medical record's (EMR) inability to place stop-gaps on telemetry orders so that orders are reviewed and renewed during a patient's hospitalization. Inappropriate monitoring due to no framework for order management leads to increased costs, alarm fatigue, and reduced quality of care.

Clinical Needs Assessment

Noncardiac indications account for 20.2% of all telemetry orders with 65% of telemetry patients remaining monitored until they were discharged from the hospital (Chen, et al., 2017). A nurse-driven protocol to manage cardiac telemetry orders has decreased inappropriate telemetry usage by 9%, reduced monitored days by 0.53 days and led to an overall decrease of telemetry usage and daily cost by 70% (Chen, et al., 2017).

Problem Statement

Will a nurse-driven protocol to discontinue telemetry improve compliance with AHA guidelines for telemetry for acute care patients at the large midwestern healthcare organization?

Background and Significance of the Problem

Review of the Literature

A search of the literature was completed using MEDLINE, CINAHL, the Cochrane Central Register of Controlled Trials. Key terms used in these databases were telemetry, discontinue, discontinuation, nurse, and protocol. The Cochrane Central Register returned 15 controlled trials; however, none that were applicable to this project proposal. MEDLINE and CINAHL databases searches returned four articles and a systematic review. Google was used to locate the AHA guidelines for telemetry orders.

Literature Review/Synthesis

Cardiac telemetry provides clinical data leading to early detection of cardiac dysrhythmias (Chen, et al., 2017). However, up to 35% of all telemetry days are without cardiac indication (Benjamin, Klugman, Luckmann, Fairchild, & Abookire, 2013). Of the seven most common admission indicators, only two are identified by the AHA as appropriate diagnoses for telemetry (Crawford & Halm, 2015). Further, telemetry monitoring is continued longer than recommended by the AHA (Perrin, et al., 2017). Sixty-five percent of telemetry patients remain on telemetry until they are discharged (Chen, et al., 2017).

The AHA (Drew, et al., 2004) established a set of clinical guidelines outlining indicators for telemetry orders. The guidelines were updated based on data from evidence-based practice (Sandau, et al., 2017). The guidelines are comprised of three classes of monitoring. Class I is the highest risk patients in which most patients should be monitored (Perrin, et al., 2017). For class II or moderate-risk patients, monitoring is not essential for all patients but could be beneficial for

some (Perrin, et al., 2017). Class III patients do not require monitoring because the risk of a cardiac event is so low that monitoring would not be of benefit to the patient or practitioner (Perrin, et al., 2017). When telemetry orders were managed using the AHA guidelines, 68.4% of patients' telemetry was discontinued (Benjamin, et al., 2013).

Appropriate telemetry usage leads to reduced costs of care and alarm fatigue, as well as improved quality of care (Benjamin, et al., 2013; Perrin, et al., 2017; Cantillon, et al., 2016). If the nonindicated days of telemetry were eliminated, a healthcare organization may see an annual minimum savings up to $415,662 (Benjamin, et al., 2013). Additional revenue is generated through improved patient throughput by transferring patients to a lower level of care within the healthcare organization (Bubb, 2011). The telemetry bed would then be available for a new patient in need of monitoring. There is a loss of $204 opportunity cost for every telemetry patient who remains in the emergency department due to lack of telemetry beds, (Chen, et al., 2017)

Alarm fatigue is a significant issue with 99.4% of alarms being false (Chen, et al., 2017). Patients eligible for telemetry discontinuation are "unlikely to benefit from telemetry but likely to generate nuisance alarms" (Cantillon, et al., 2016, p. 523). Nuisance alarms are caused by ineffective telemetry lead placement, such as artifact, and equipment issues, such as empty battery or removal of telemetry leads. Although Perrin, et al. (2017) did not see a reduction in the number of telemetry alarms from the use of AHA guidelines in telemetry order management, the healthcare organization already had measures in place to reduce the number of alarms.

Improved quality of care results from appropriately managed telemetry orders. Per Chen, et al. (2017), nurses can spend up to 20 minutes daily per patient telemetry maintenance. With an average patient load of five patients, this is 100 minutes per day that could be used for patient

education and other nursing tasks. Inappropriate telemetry monitoring also leads to patient harm by being the catalyst for interventions that were not needed (Chen, et al., 2017). Perrin, et al. (2017) found that despite the significant reduction in telemetry monitoring duration, the number of codes or rapid response calls did not increase.

The use of a nurse-driven protocol to manage telemetry orders has shown positive outcomes (Perrin, et al., 2017). Implementation of a protocol developed from AHA guidelines resulted in a "75% decreased likelihood of remaining on a telemetry monitor until discharge" (Perrin, et al., 2017, p. 130). The mean decrease of telemetry hours was 25 hours, $p < .005$, which is a statistically significant result (Perrin, et al., 2017).

Significance of Clinical Problem to Nursing

Up to 99.4% of telemetry alarms may be false (Chen, et al., 2017). Artifact, clinically irrelevant or nuisance alarms, and technical issues, such as leads off, are among the highest contributors of alarm fatigue (Ruppel, 2018). Alarm fatigue and alarm response is a concern nationally as The Joint Commission (2020, p. 1) has developed a National Patient Safety Goal to "make improvements to ensure that alarms on medical equipment are heard and responded to on time." Audible alarms from telemetry and other hospital equipment as well as phone call notifications of telemetry alarms by monitor technicians from the organization's CMU can be overwhelming for nurses. Additionally, the false alarm may require the nurse to go to the patient's bedside to verify if the alarm if accurate and pulling the nurse's attention away from patients who genuinely need care (Najafi, 2019).

Nurses have an ethical responsibility to protect and advocate for patients' rights, safety and their health (Haddad & Geiger, 2020). Inappropriate telemetry monitoring may conflict with the Code of Ethic for Nurses by instigating patient physical and emotional harm. Monitoring patients with a noncardiac indication may "reveal clinically unimportant abnormalities that obligate physicians to work them up, just by virtue of having seen them on monitor. The work-up then results in unnecessary cost and anxiety" (Najafi, 2019, para. 3). Further, patient movement may be restricted because the telemetry leads may fall off requiring replacement. Reduced exercise, even if minimal during hospitalization, may lead to muscle atrophy (Najafi, 2019). Patients may experience disruptions with sleep cycles due to lead placement or as a result of reduced physical activity, which may lead to hospital-induced delirium requiring testing, psychiatric consults, additional medications (Harvard Medical School, 2018).

Project Implementation and Measures

Theoretical Framework

Donabedian (1965) developed his conceptual framework to provide an alternative method for measuring quality of medical care. He identified that historically, medicine would select from any number of criteria to determine the quality of care. However, there may be occasions in which the selected criteria do not describe the level of quality. The results may also be so delayed that the clinician may be unable to determine what is impacting the level of quality. The framework relies on a simple, linear concept of structure-process-outcomes; changing the structure or process will impact the outcome. The relationship between structure, process and outcome is one direction; that is, structure influences processes, which in turn impacts outcomes. The relationship does not flow in the opposite direction. Donabedian used structure and process

to assess quality because the outcome may not be "relevant" or available when needed to assess quality (1965, p. 168). While the model includes the structure-process-outcome approach to clinical problems, the framework is not concrete enough to be applied to specific issues. Although the theory was developed with healthcare in mind, this truly is a theory for quality improvement.

Project Purpose

The overall purpose of this project is to reduce telemetry census within 30 days on a selected acute care unit within a large midwestern healthcare organization using AHA guidelines (Sandau, et al., 2017) in determining the need to continue telemetry monitoring.

Objectives

The first objective was to develop a nurse-driven protocol assessment tool based on AHA guidelines to be used by nurses on an acute care unit. The tool would then be used to assess the need for continued telemetry monitoring.

The second objective of this project was to educate the leadership team, including the Chief Nursing office (CNO), of the selected acute care unit and its nursing staff on the implementation of the AHA-based assessment tool. The education will include handouts and in-person meetings.

The third objective was to implement the tool on the chosen acute care unit for 30 days.

Method

Target Population and Sample. The target population were patients on one acute care unit within the large midwestern healthcare organization. The selected unit had a monthly average telemetry census of 127 medical-surgical, oncology or palliative care patients. Participants were registered nurses (RNs) employed by the unit. All patients admitted to the unit with a telemetry order at were to be evaluated using the assessment tool. No other inclusion criteria were required. A convenience sample of 72 patients were included in this project.

Procedure. Training to the RNs on the selected unit was provided during two unit meetings. The assessment tool was reviewed along with directions on how to complete the tool. The RNs were instructed to assess every telemetry patient with the tool by 1600 daily and place the completed tool into a locked box inside the nurse manager's office. RNs were informed during training that participation was voluntary, and completion of the forms was anonymous. The RNs reviewed and signed a consent form (Appendix B).

The CMU maintains a database of monitored patients that is sorted by hospital and unit. The CMU manager provided pre-implementation data reporting number of patients monitored for 30 days prior to implementation of the assessment tool (Appendix E). The CMU manager also provided post-implementation data collected for 30 days simultaneously with the collection of the assessment tool from the selected acute care unit (Appendix F).

Timeline

The assessment tool, based on AHA guidelines to identify patients appropriate for early telemetry discontinuation, was adapted from a similar tool used by The Johns Hopkins Hospital (2014). The adaptation of the tool was completed on September 18, 2019 (Appendix C).

The Otterbein University Institutional Review Board (IRB) application, RN education, assessment tool, RN consent form and data collection form were submitted to the Otterbein University IRB on September 19, 2019. Approval from the Otterbein IRB was obtained on September 24, 2019 (Appendix A). Approval from the healthcare organization's Office of Research Affairs to proceed as a quality improvement project was obtained on October 7, 2019 (Appendix D).

Education of the nursing staff from the selected unit included handouts of the assessment tool, a brief synopsis of the project and was completed during staff meetings conducted in two sessions in October 2019. The project was reviewed with the CNO of the selected unit on October 16, 2019. Mock-up and reference versions of the assessment tool were provided to all RNs on the selected unit based on the recommendation of the CNO.

Collection of pre-implementation data from the CMU patient database was from September 29, 2019 to October 27, 2019. Implementation of the assessment tool on the selected unit was from October 28, 2019 to November 27, 2019.

Budget

The assessment tool, educational handouts and educational presentation were developed within seven hours. Education of the nursing team was completed with two in-person

presentations for each team of practitioners, approximately one hour each session for a total of two hours. Education was also provided to the CNO, lasting 30 minutes.

In addition to time, direct costs are considered as part of the budget process. "Direct costs include items such as equipment and supplies" (Moran, Burson, & Conrad, 2017, p. 297). Supplies required for the project were paper, ink and office equipment required to develop, present and duplicate educational materials and the paper assessment tool.

Analysis and Outcome Evaluation

Pre-implementation data provided by the CMU manager showed that 108 patients were monitored on telemetry for a mean of 4.65 days. Post-implementation, the CMU manager provided data that showed 124 patients were monitored on telemetry for a mean of 3.63 days.

The RNs from the selected unit completed and submitted assessment tools for 74 patients. The collected assessment tools were reviewed for completion accuracy. Not all patients monitored by the CMU were assessed with the tool. Some tools were missing the date that telemetry was started, the date the tool was completed or both. Not all submitted tools included the last 3 digits of the patient's medical record number (MRN) or were unable to be paired with an MRN from the CMU-provided data. Collected assessment tools that were incomplete or did not pair with a patient from the CMU-provided data were scrubbed from the data set. A total of 14 patients had correctly completed assessment tools that were also paired with CMU-provided data. The 14 patients were monitored for a mean 4.2 monitored days. The completed assessment tools indicated that these patients had a mean of 2.92 potentially monitored days.

The project demonstrated a potential reduction in telemetry monitored days by 1.28 days or a potential 30.5% decrease in telemetry monitoring at this site. Results are higher than indicated in the literature as Chen, et al. (2017) found that nurse-driven protocols for telemetry order management reduced utilization 9% or 0.53 monitored days.

One completed assessment tool was utilized by an RN during a discussion with the patient's physician about appropriateness of telemetry monitoring. The physician reviewed the assessment tool, agreed with the recommendation and discontinued the telemetry order.

Conclusion and Recommendations

Based on the favorable outcome, the recommendation would be to implement the assessment tool on similar units. However, the RN education may need to be more robust for greater understanding of the AHA guidelines and include practice scenarios to assist in understanding of how to accurately complete the assessment tool. The returned tools were completed with wide variability regarding bundle requirements and acute versus chronic arrhythmia monitoring. The selected acute care unit utilizes bundles of orders for admission to the unit. Some of the forms indicated that telemetry was indicated due to *admission*, which is not an indication based on AHA guidelines. Further, clarification to the nursing staff on AHA guidelines for acute versus chronic arrhythmia monitoring is required. Some returned tools were completed with *atrial fibrillation* as an indication. While new-onset of atrial fibrillation may require cardiac monitoring, chronic atrial fibrillation is not automatically monitored under AHA guidelines. RN champions may be beneficial in implementation by serving as an expert on assessment tool completion. There would also be benefits in seeking feedback from the RNs who

participated in this project for assessment tool understanding, ease of completion and identification of barriers to completing the tool.

The assessment tool would be limited to only acute care or intermediate care units that use cardiac telemetry. Patients in a critical care setting are not appropriate for the assessment tool as telemetry is a standard of care in critical care settings (Sandau, et al., 2017).

"The estimated total daily cost to deliver telemetry was $53.44 per telemetry patient" (Boyles, 2014, para. 17). The selected acute care unit for the project has an average monthly census of 127 telemetry monitored patients. The project saw a 30.5% reduction in telemetry monitoring, or an approximate reduction of 38.73 patients monitored with telemetry. At a cost of $53.44 per telemetry patient for care, the unit may see a reduction of $24,839 annually. On a larger scale, the healthcare organization monthly monitors approximately 3500 telemetry patients in acute and intermediate care areas. Reducing monitoring by 30.5% or 1,067.5 patients would result in a cost savings of $684,566 annually. If twenty-five percent of the remaining monitored patients, or 608.25 patients, are positively impacted by improved throughput from the ED to an inpatient unit, the organization may see an annual reduction of $1,488,996 in lost opportunity cost.

Nurses have an average hourly rate of $34.11 (Glassdoor, 2019). A nurse spends 20 minutes daily troubleshooting telemetry issues for every telemetry-monitored patient (Chen, et al., 2017). If there is a reduction of 1067.5 telemetry monitored patients across the organization annually, there may be an annual savings of $145,649 in nursing wages. This would be a combined cost savings of $2,344,048 for the organization annually. This savings may be

increased as more than one nurse may need to provide telemetry maintenance on the same patient.

Summary

Nurse-driven protocols to manage telemetry orders has shown significant reduction of telemetry utilization, which can lead to improved outcomes in terms of cost, alarm fatigue and patient care. A telemetry utilization assessment tool based on AHA guidelines was adapted from an existing tool. IRB approval was obtained. RNs from the identified acute care unit were educated on how to use the assessment tool and the tool was implemented for 30 days. Consent from the RNs to participate in the project was obtained. Telemetry utilization data was collected from the healthcare organization's CMU patient database, which included the number of days monitored both pre- and post-implementation. After the implementation phase was completed, submitted assessment tools were reviewed for completion accuracy and paired with monitored patient data from the CMU database. Fourteen patient assessment tools were identified as completed correctly with all required information. Results are favorable with a potential 30.5% decrease in telemetry monitored days and a potential savings of over $2 million annually to the identified healthcare organization. The project could be implemented again across additional acute or intermediate care units with more time spent on RN education and the use of RN champions to assist with assessment tool completion compliance.

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Appendix A

OTTERBEIN UNIVERSITY

INSTITUTIONAL REVIEW BOARD

X Original Review
____ Continuing Review
____ Amendment

Dear Dr. Hammer,

With regard to the employment of human subjects in the proposed research:

IRB # 19/20-07
Hammer & Dripps: The Beat Stops Here: A Nurse-Driven Protocol to Manage ...

THE INSTITUTIONAL REVIEW BOARD HAS TAKEN THE FOLLOWING ACTION:

____ Approved	____ Disapproved
✓ Approved with Stipulations*	____ Waiver of Written Consent Granted
✓ Limited/Exempt/Expedited Review	____ Deferred

* Once Stipulations stated by the IRB have been met by the investigator, then protocol is APPROVED.

1. As Principal Investigator, you are responsible for ensuring that all individuals assisting in the conduct of the study are informed of their obligations for following the IRB-approved protocol.
2. It is the responsibility of the Principal Investigator to retain a copy of each signed consent form for at least four (4) years beyond the termination of the subject's participation in the proposed activity. Should the Principal Investigator leave the university, signed consent forms are to be transferred to the IRB for the required retention period.
3. If this was a limited, exempt, or expedited review, there is no need for continuing review unless the investigator makes changes to the proposed research.
4. If this application was approved via full IRB committee review, the approval period is one year, after which time continuing review will be required.
5. You are reminded that you must promptly report any problems to the IRB, and that *no procedural changes may be made without prior review and approval.* You are also reminded that the identity of the research participants must be kept confidential.

Date: 24 September 2019 Signed: Meredith C. Jones
Chairperson

(Revised January 2019)

* Additional approval from cooperating institution IRB may be required prior to soliciting consent from nurses

Appendix B

The Department of Nursing at Otterbein University supports the practice of protection for human subjects participating in research. The following information is provided for you to decide whether you wish to participate in the present study. You should be aware that even if you agree to participate, you are free to withdraw at any time without penalty.

We are interested in studying the potential decrease in overall telemetry usage on your unit using a nurse-driven protocol for telemetry order management. You will be participating in one educational session to learn how to use the protocol. After implementation, the protocol form will need to be completed once daily for every telemetry patient. It is estimated that the educational session will take no more than 15 mins of your time. Completion of the protocol form should take no more than 10 minutes per telemetry patient per day. There is no risk to the patients in this study or to you as a participant.

Your participation is solicited although strictly voluntary. Although your name is requested to be included on the protocol form, this is for follow up questions only if needed. If you would like additional information concerning this study before or after it is complete, please feel free to contact me by phone or mail.

Sincerely,

Dr. Kirk Hummer, Principal Investigator
445 Science Center; 155 W. Main St.
614-823-1614

Signature of subject agreeing to participate

With my signature I affirm that I am at least 18 years of age

Appendix C

Mount Carmel Health System – Office of Research Affairs (ORA)
Quality Improvement vs Research Determination Checklist

Title of Project: The Beat Stops Here: A Nurse-Driven Protocol to Manage Telemetry Orders

Project Lead: Kirk Hummer/Holly Dripps **Department/Unit:** Otterbein University

This table is intended to compare and contrast the general characteristics of quality improvement (QI) and clinical research activities*

For each item, choose the description of each attribute as it most likely relates to your project. Please forward the completed, signed checklist and a brief summary (guidelines attached) of your project to ORA@mchs.com

Attribute	Quality Improvement	Clinical Research with Human Subjects
Goal/Purpose	☑ Improves healthcare processes/care in local settings with limited application beyond local context	☐ Generates new knowledge applicable to other populations
	☒ Changes in processes or interventions are based on an established body of applicable scientific evidence, published professional guidelines or standards, or internal performance data (for operational changes)	☐ Untested (or under-tested) or new interventions which are based on scientific theories or hypotheses. Identifies a specific deficit in scientific knowledge from the literature
Methods	☐ Established QI models and methodologies including Continuous Quality Improvement, Plan-Do-Study-Act, Six Sigma, Lean, etc.	☒ Theoretical model guiding research design and analysis
	☒ Mechanisms of the intervention are expected to change over time in response to ongoing feedback; adjustments may be made to refine process as project progresses	☐ Specific protocol defines the intervention, interaction and **use of collected data and/or tissues** prior to the start of the project. Project may rely on the randomization to enhance confidence in differences
	☒ Plan for intervention and analysis includes an assessment of the system	☐ May use qualitative and quantitative methods to make observations, and to make comparisons between groups to answer the study hypotheses
	☐ Statistical methods evaluate system level processes and outcomes over time with statistical process control or other methods	☒ Statistical methods primarily focus on individuals (e.g., patients, colleagues, students) as the unit of analysis. There may be adjustment of results based on relevant individual characteristics (e.g., age, co-morbidities).
Included Participants	☒ All subjects in a specific setting; power analysis not applicable.	☐ Specific subjects meeting inclusion/exclusion criteria; generally requires a power analysis to establish number of subjects needed; may use control groups

*Adapted from a publication entitled: An Instrument to Differentiate between Clinical Research and Quality Improvement, Ogrinc, Greg, William A. Nelson, Susan M. Adams and Ann E. O'Hara; IRB Ethics & Human Research; September – October 2013; Vol 35, Number 5. / *Version 082514: Issued and adopted by SJMHS Ann Arbor IRB Office (734-712-5470) D. Wahlberg* Revised 09/30/14: Issued and adopted by MCHS IRB Office 9/22/16; revised 1/8/19

Mount Carmel Health System – Office of Research Affairs (ORA)
Quality Improvement vs Research Determination Checklist

Attribute	Quality Improvement	Clinical Research with Human Subjects
Intended Impact	☒ Improvements immediately applicable to local setting; benefits to participants are expected as part of the process	☐ Direct benefit to each individual participant or to the institution is not typically the intent or is not certain
	☒ Potential local institutional benefit is specified (e.g., increased efficiency or decreased cost)	☐ Potential societal benefit in developing new or advancing existing generalizable knowledge
Risks	☒ No added risks to participants; goal is quality, safety, operational improvement and/or risk reduction based on established best practices.	☐ Participants may be exposed to risks beyond everyday life, with their consent
Applicability of Results	☒ Dissemination is primarily local; may be disseminated outside organization if data protections are in place and with appropriate organizational approval	☐ Primary goal is to disseminate at research conferences and in peer-reviewed journals
	☒ Implementation is immediate so that review of results occurs throughout the process and may be used for next QI activity	☐ Results are intended to generalize beyond the institution

Note: If a publication is anticipated, consider the journal requirements regarding IRB reviews/determinations. IRB reviews cannot occur after data collection. Any IRB review must be prospective, that is, BEFORE any data collection work commences.

Explanation and Elaboration of Terms

1. Quality Improvement: the combined and unceasing efforts of everyone – health care professionals, patients and their families, researchers, administrators, payers, planners, educators – to make changes that will lead to better outcomes, system performance, and professional development.
2. Clinical Research: a systematic investigation in a clinical setting designed to develop or contribute to generalizable knowledge (the Federal Policy for the Protection of Human Subjects or "Common Rule" definition of research). If an activity such as public health practice, program evaluation, or quality improvement includes a research component, then IRB review must occur under current federal guidance and MCHS IRB policies.

Person Completing Checklist: Holly Dripps _____ _____ 10/03/2019
Print Name *Signature* *Date*

Completed Checklist Reviewed by: _____ *Office of Research Affairs Representative*

Please forward the completed signed, checklist and a brief summary of your project to ORA@mchs.com

Once the form has been signed Office of Research Affairs, retain a copy in your study/project records for future reference.

Adapted from a publication entitled: An Instrument to Differentiate between Clinical Research and Quality Improvement; Ogrinc, Greg, William A. Nelson, Susan M. Adams and Ann E. O'Hara; IRB Ethics & Human Research; September – October 2013; Vol 35, Number 5. / Version 082814: Issued and adapted by SJMHS Ann Arbor IRB Office (734-712-5470) D. Wahlberg Revised 09/30/14: Issued and adapted by MCHS IRB Office 9/22/16; revised 1/8/19

Appendix D

COSH SHAREDMB ORA <ORA@mchs.com>
Mon 10/7/2019 11:03 AM
Dripps, Holly

Hi Holly,

I think this is a great project addressing a really important issue. After review, we feel it does not meet be criteria to be considered research, therefore you may proceed without submitting paperwork to the IRB. The ORA does not need any additional information from you in reference to this project.

Thanks,
Elissa

Elissa VanKirk, BSN RN CCRN
Research Nurse, Office of Research Affairs
Mount Carmel Health System | A Member of Trinity Health
O: 614-546-4327 | F: 614-546-4328
elissa.vankirk@mchs.com | mountcarmelhealth.com

BECAUSE OF YOU
MOUNT CARMEL

Appendix E

PROTOCOL FOR DISCONTINUING ADULT CARDIAC TELEMETRY (NURSE-DRIVEN)

Last 3 digits of MRN: _____

	INDICATION	MEETS D/C CRITERIA — ALL OF THE CRITERIA LISTED NEXT TO DIAGNOSIS MUST BE MET AT THE TIME OF ASSESSMENT
CLASS I	Post Resuscitation-Cardiac Arrest	☐ YES ☐ NO ICD implanted or underlying problem resolved ≥24 hrs free hemodynamically significant arrhythmia or return to baseline ≥ 24 hrs hemodynamically stable* Electrolytes corrected or return to baseline value
	ACS/STEMI	☐ YES ☐ NO ≥24-48 hrs absence of chest pain ≥ 24-48 hrs hemodynamically stable or return to baseline* Troponins <0.04 mcg/L over 6 hrs Cardiac infarct "ruled out" ≥ 24-48 hrs absence ST changes
	Cardiac Surgery	☐ YES ☐ NO >48-72 hrs post-op or until discharge from acute care unit
	Hemodynamically significant arrhythmias	☐ YES ☐ NO ≥ 24 hrs hemodynamically stable or return to baseline * ≥ 24 hrs free of hemodynamically significant arrhythmia No requirement of IV medication for rate/rhythm control
	ICD shocks	☐ YES ☐ NO Precipitating event treated or monitor for duration of hospitalization
	Implantion of Pacemaker or ICD (dependent or non-dependent)	☐ YES ☐ NO ≥ 12-24 after implantation, free from hemodynamically significant arrhythmia
	CHF or Stroke	☐ YES ☐ NO ≥ 24-48 hrs hemodynamically stable or return to baseline* ≥ 24-48 hrs free of hemodynamically significant arrhythmia
	Syncope	☐ YES ☐ NO ≥ 24 hrs hemodynamically stable or return to baseline* ≥ 24 hrs free of hemodynamically significant arrhythmia Underlying cause and treatment identied (monitor based on guidelines for findings)
	Drug Overdose or Moderate to Severe K or Mg Imbalances	☐ YES ☐ NO ≥ 24 hrs hemodynamically stable or return to baseline* ≥ 24 hrs free of hemodynamically significant arrhythmia Drug/toxin levels optimized or electrolyte abnormality corrected or return to baseline values
CLASS II	Infective endocarditis	☐ YES ☐ NO ≥ 48 hrs without persistently positive blood cultures, evidence of endovascular source (cardiac vegetation or abcess) or clinical vascular/immunologic criteria
	Non-cardiac thoracic surgery (Dependent on procedure and risk)	☐ YES ☐ NO >48-72 hrs post-op or until discharge from acute care unit
	Post-Op/Procedure non-urgent PCI with complications	☐ YES ☐ NO ≥ 24 hrs post procedure or complication is resolved
OTHER	Sepsis/ Pulmonary Embolism	☐ YES ☐ NO ≥ 24 hrs hemodynamically stable or return to baseline* ≥ 24 hrs free of hemodynamically significant arrhythmia
	Bundle requirement	☐ YES ☐ NO Bundle ordered:
	Other indication: _____ _____	☐ YES ☐ NO ≥ 24 hrs hemodynamically stable or return to baseline* ≥ 24 hrs free of hemodynamically significant arrhythmia

Discontinue telemetry:
☐ YES ☐ NO
Reason to discontinue:
☐ Protocol-driven
☐ Does not meet any protocol criteria

Date telemetry started: _____

Date form completed: _____

Hemodynamically stable = HR 60-100; SBP > 90

FOR RESEARCH PURPOSES ONLY NOT PART OF MEDICAL RECORD

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Appendix F

Pre-Implementation Data (CMU)			
Number of Days Collected	Range of Days Monitored	Number of Patients Included	Mean of Monitored Days
30	1-14	107	4.6542056

Appendix G

Post-Implementation Data (CMU)			
Number of Days Collected	Range of Days Monitored	Number of Patients Included	Mean of Monitored Days
30	1-14	123	7.3461538

Appendix H

Post-Implementation Data (Collected Forms)			
Number of Days Collected	Range of Days Monitored	Number of Patients Included	Mean of Monitored Days
30	1-15	72	3.8787879

Appendix I

Post and Collected Scrubbed (CMU and Collected Forms)				
Last 3 MRN	Date Started	Date Ended	Number of Days Monitored	Number of Days Monitoring Reduced
134	10/28/19	11/05/19	9	
134	10/28/19	11/01/19	5	-4
166	11/07/19	11/12/19	6	
166	11/07/19	11/12/19	6	0
187	10/28/19	10/30/19	3	
187	10/28/19	10/30/19	3	0
262	11/18/19	11/21/19	4	
262	11/18/19	11/20/19	3	-1
530	11/20/19	11/21/19	2	
530	11/20/19	11/20/19	1	-1
613	11/11/19	11/12/19	2	
613	11/11/19	11/12/19	2	0
706	11/23/19	11/25/19	3	
706	11/23/19	11/25/19	3	0
728	11/10/19	11/14/19	5	
728	11/10/19	11/13/19	4	-1
748	11/18/19	11/18/19	1	
748	11/18/19	11/18/19	1	0
804	11/18/19	11/20/19	3	
804	11/18/19	11/20/19	3	0
881	11/24/19	11/27/19	4	
881	11/24/19	11/26/19	3	-1
886	11/20/19	11/22/19	3	
886	11/20/19	11/20/19	1	-2
914	10/29/19	11/05/19	8	
914	10/29/19	10/31/19	3	-5
965	11/06/19	11/12/19	7	
965	11/06/19	11/08/19	3	-4

Appendix J

Post and Collected Scrubbed-Days Only		
Patient	Actual	Potential
134	9	5
166	6	6
187	3	3
262	4	3
530	2	1
613	2	2
706	3	3
728	5	4
748	1	1
804	3	3
881	4	3
886	3	1
914	8	3
965	7	3